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Books and Pamphlets Added to the Library During January

ALMANACS

The WORLD ALMANAC and book of facts for 1953. Ed. by Harry Hansen. 68th year of publication. New York, New York World-Telegram Corp., c1953. 896 p.

ASPHALT

PFEIFFER, J. PH., ed. The properties of asphaltic bitumen, with reference to its technical applications. New York, etc., Elsevier Publ. Co., 1950. 285 p.

BOOKKEEPING

MACNAUGHTON, JOSEPH. Factory book-keeping for paper mills. London, Wood Pulp, Limited, 1900. 29 p. + 27 sample sheets.

CARBOHYDRATES

ADVANCES in carbohydrate chemistry. Ed. by Claude S. Hudson, Melville L. Wolfrom [and] Sidney M. Cantor. Associate editor for the British Isles, Stanley Peat [and] Maurice Stacey. New York, Academic Press, 1952. v. 7. 370 p.

CARDBOARD

[BOCKWITZ, HANS H., and KOTTE, HANS] Cardboard in the course of time; essay on the story of cardboard. To the fiftieth anniversary of the Feldmühle Works Arnsberg, Westphalia, Germany, 1901-1951. [Hillegossen] Feldmühle Papier- und Zellstoffwerke Aktiengesellschaft [c1950] 100 p.

CHEMISTRY—TABLES

HANDBOOK of chemistry and physics, a ready reference book of chemical and physical data. 34th ed. Editor in chief, Charles D. Hodgman. Cleveland, Chemical Rubber Publ. Co. [c1952] 2950 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer Verlag, 1952. 19 Band. 572p.

CONTAINERS

SALADE, ROBERT F. How paper boxes are made; a practical and instructive book telling how the beginner may manufacture all kinds

of paper boxes, with special chapters on the printing department for paper box plants, embossing, gold-leafing, label work, etc. Lafayette, Ind., The Shears Publishing Company, 1920. 225 p.

U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Corrugated and solid fiber boxes for canned fruits and vegetables; a recorded voluntary recommendation of the trade. Simplified practice recommendation 146-52. [Washington, U. S. Govt. Print. Off., 1952] 14 p.

PAPER MAKING AND TRADE

CLAPPERTON, ROBERT HENDERSON. Modern paper-making. [3d ed.] Oxford, Basil Blackwell, 1952. 526 p.

CROSS, C. F., and BEVAN, E. J. A text-book of paper-making. 3d ed., containing additional matter, and in part re-written, with collaboration by J. F. Briggs. London, E. & F. N. Spon, Ltd., etc., 1907. 411 p.

PRINTING

HARTSUCH, PAUL J. Chemistry of lithography. New York, Lithographic Technical Foundation [c1952] 254 p.

STATISTICAL METHODS

GOULDEN, CYRIL H. Methods of statistical analysis. 2d ed. New York, Wiley [c1952] 467 p.

TALL OIL

LINDER, ÅKE. Tall oil refining. Ingeniörvetenskapsakademien nr. 207. Stockholm, Generalstabens Litografiska Anstalts Förlag, 1952. 56 p.

TEXTILE INDUSTRY AND FABRICS

AMERICAN SOCIETY FOR TESTING MATERIALS. *Committee D-13 on Textile Materials.* ASTM standards on textile materials (with related information). Specifications, tolerances, methods of testing, definitions and terms. Philadelphia, The Society, 1952. 660 p.

TRADE DIRECTORIES

PHILLIPS' paper trade directory of the world, 1953, with which is incorporated "Phillips' directory of paper makers of Great Britain and Ireland" and "Phillips' paper trade directory of the British Empire." London, S. C. Phillips & Co., c1953. 864 p.

WATER—POLLUTION

PROCEEDINGS of the Seventh Industrial Waste Conference, May 7, 8 & 9, 1952. Sponsors: School of Civil Engineering and Division of Technical Extension, Purdue University; Division of Sanitary

Engineering, Indiana State Board of Health. Engineering Extension Department. Extension series no. 79. Lafayette, Ind., Purdue University [1952] 569 p.

WOOD

NORTHEASTERN WOOD UTILIZATION COUNCIL. Pulpwood from small woodlands. Bulletin no. 40. New Haven, The Council, 1953. 77 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

RICE, WILLIAM J. Variables in purchasing adhesives for converting. Am. Paper Converter 27, no. 1: 17-19 (January, 1953).

Four variables which affect adhesive results in the user's plant are materials, machinery, men, and maintenance. The choice of a proper adhesive involves finding one whose efficiency can be stated in terms of these operational variables. Tests are suggested for the determination of stability, viscosity, wet and dry bondage, viscosity flow rating, tackiness, spread, chemical reactivity, skinning, foaming, water resistance, warping, odor, color, solvents, and pH. A method of preventing skinning is described. L.C.

ALKALINE PROCESSES

JAYME, GEORG, and LICHT, WERNER. The influence of the sulfidity on the alkaline pulping of beechwood. Das Papier 6, no. 21/22: 450-6; no. 23/24: 510-13 (November, December, 1952). [In German]

Following a brief review of publications in which the beneficial influence of sodium sulfide (I) in the sulfate cook is discussed, the authors give a detailed description of their laboratory investigations with beechwood chips and sulfate liquors of 14 different sulfidities (in the range of 0 to 30%), with frequent reference to the previous studies by Jayme, Wagenbach, and Deloff (*cf.* B.I.P.C. 10: 4-5, 148). The alkali concentration was kept constant at 3%, 10% of which was present in the form of sodium carbonate; the percentages of sodium hydroxide and (I) only varied. The total cooking period amounted to 5.5 hours, of which three hours were at the maximum temperature of 160°C. The testing procedures for the evaluation of the chemical and physical properties of the resulting pulps are outlined and supplemented by graphical and tabular data. The results showed a decided average optimum at a sulfidity of 20%, which is considerably lower than the sulfidity of 30-40% recently found by Rothrock and Nolan for scrub oak (*cf.* B.I.P.C. 22: 417; 23: 83-4). In addition, the authors found that cooking liquors of rather low sulfidity will give very favorable results; for instance, a sulfidity of 5% gave the same pulp yield as the optimum sulfidity of 20%. The pulp could still be bleached and was low in screenings. The same 5% sulfidity resulted in almost half of the increase of the mean strength properties obtainable with (I), including higher values for interior tear than those obtained at 20% sulfidity. When brightness was included in the comparison, a sulfidity of 5% resulted in an approximate 67% increase of the maximum amount of the over-all quality number possible with (I). The decided beneficial effect of small quantities of (I) on beechwood must probably be traced to the chemical constitution of the protolignin of this species. In contrast to spruce protolignin, the compound is richer in methoxyl groups and does not condense readily to difficultly soluble modifications of a higher molecular weight; the dissolution process is therefore promoted by comparatively low amounts of (I). In addition, beechwood has originally a lower lignin percentage than spruce. Similar conditions will probably hold for annual plants. The problem is of

particular significance in densely populated areas where the erection of sulfate mills for utilizing beechwood or annual plants is planned. On account of anticipated odor troubles, preference has so far been given to the soda process, in spite of the fact that it gives weaker pulps than the sulfate process. 5 tables, 13 figures, and 26 references. E.S.

JONES, FRANKLIN L. A kraft pulp mill. Paper Mill News 76, no. 2: 12-15 (Jan. 10, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952. The author describes the operations and typical equipment of a sulfate mill. E.S.

NOLAN, WILLIAM J. The sulphate process. Paper Mill News 76, no. 2: 20-32 (Jan. 10, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952. The author gives a rather detailed description of the variables involved in the sulfate process under the main headings: wood species and end use of pulp, chip size, cooking liquor, cooking time, cooking temperature, size of digester, method of charging, liquor circulation, and method of heating. 8 tables and 16 figures. E.S.

ASSOCIATIONS

MEHTA, V. Indian Paper Makers' Association. Indian Print & Paper 18, no. 2: 13-14, 16 (October, 1952).

The chairman of the Association reviews the activities in the Indian paper industry during 1951 at the annual meeting held in Calcutta; excerpts from his speech are given dealing with prices, planning, targets, exports and imports, freight and transportation, etc. E.S.

BACTERIOLOGY

OWEN, WM. L. Pinning down bag-borne bacteria. Food Eng. 25, no. 1: 57-8, 132, 134 (January, 1953).

With the rigid restrictions proposed by the American bottlers of carbonated beverages—that sugar supplied to them contain no more than 10 molds/10 g.—the possible contamination of bagged refined sugar through the packaging medium was investigated. The methods used for determining the presence, concentration, and distribution of mesophilic micro-organisms per square inch of internal surfaces of paper bags employed by the sugar refineries are described. The results indicate that, although the total numbers of bacteria in the bags are insufficient to contribute materially to the bacterial content of the sugar, they are not uniformly distributed over the entire area and, in some instances, six times as many bacteria were found on the bottom of the bags than on the sides; both molds and viable yeast were found to be present. When the increase in mold and yeast counts before and after bagging of the sugar was checked, the results indicated that the bags not only contributed a definite increase to the mold count of the sugar, but in seven out of nine cases, the increases were sufficient to make the counts exceed the limits prescribed by the bottlers. 5 tables and 1 illustration. E.S.

BAGASSE

WILLIAMS, A. E. Pulp from agricultural residues. World's Paper Trade Rev. 138, no. 24: 1850, 1852, 1854, 1859-60 (Dec. 11, 1952).

The author discusses the possibilities of straw and bagasse (the latter in particular) as raw materials for the paper industry, with reference to the Celdecor process, and its recent developments and installations. 11 illustrations. E.S.

BARK

JENSEN, W. Studies on suberin. IV. Isolation of phloionic acid from suberin of *Quercus suber*. Paper and Timber (Finland) 34, no. 12: 467-8, 470 (December, 1952). [In English] *cf.* B.I.P.C. 21: 229.

The author briefly reviews his previous work and fully describes the isolation and identification of phloionic acid (I), $C_{18}H_{34}O_4$, melting at 122.8-124°C. The melting point and subsequent analyses prove (I) to be identical with the compound previously isolated and characterized by Zetzsche and Bähler (Helv. Chim. Acta: 14: 846-9 [1931]). 1 table and 8 references. R.C.R.

SUMMERS, B. D. Bark-burning stoker solves paper mill problem. Paper Mill News 75, no. 49: 106, 108 (Dec. 6, 1952).

A constant ash-discharge spreader-stoker installed in connection with a Badenhausen boiler for burning the bulk of the bark produced in a southern mill is described. Three gas burners are dormant under normal operating conditions; they are turned on when bark flow is irregular to maintain the desired boiler output. 1 table and 2 figures. E.S.

BARKERS AND BARKING

CARPENTER, R. J. New Carpenter debarker. Pulp & Paper 27, no. 1: 86, 88 (January, 1953).

A new portable debarker for southern pines and hardwoods is described briefly. It has been used effectively on pulpwood ranging from 4 to 16 inches in diameter, although smaller and slightly larger sizes have also been handled occasionally. The barker is constructed by Söderhamn Machine Mfg. Co., Talladega, Ala. 2 illustrations. E.S.

BIOCHEMICAL TESTING

ZEHNPFENNIG, RAYMOND, and NICHOLS, M. STARR. Inoculation studies in B.O.D. determination on sewage and pulp mill waste. Sewage Ind. Wastes 25, no. 1: 61-5 (January, 1953).

The authors contribute two principal suggestions for new methods of standardizing the determination of biochemical oxygen demand in sewage and industrial wastes. Their experience indicates that the conventional five-day B.O.D. ($B.O.D._5$) is principally a function of bacterial action in the first two days and subsequently by the presence and metabolic relationships of protozoa. Data and procedures are presented which support a two-day assay ($B.O.D._2$) based upon the use of a semicontrolled bacterial inoculum prepared from sewage. 3 tables and 3 references. A.J.W.

BIRCH

GUSTAFSSON, CHARLEY, OLLINMAA, PAAVO J., and SAARNIO, JOUKO. The carbohydrates in birchwood. Acta Chem. Scand. 6, no. 8: 1299-300 (1952); *cf.* B.I.P.C. 22: 287.

The authors repeated their previous experiments with normal (I) and tension wood (II) of two Finnish birch species (*Betula pubescens* and *B.*

verrucosa); the sugars in the hydrolyzates determined by paper-partition chromatography were found to be fairly constant in (I) of both species, whereas (II) contained more galactan and glucosan, but less xylan. In a separate mild hydrolysis the authors were able to detect small amounts of rhamnose, in addition to the previously determined sugars (galactan, glucosan, mannan, araban, and xylan). 1 table and 8 references. E.S.

BLEACHING

WILSON, H. A. B. Methods of reducing the consumption of chlorine in pulp bleaching; a literature survey. Paper-Maker (London) 124, no. 5:403-4, 406-8, 410-11 (November, 1952).

A review of the literature on bleaching by the hypochlorite method is presented. Following a brief general introduction including the theory of bleaching, the material is treated in four separate sections, covering: (1) the preparation of bleach liquor when hypochlorite bleach is used exclusively; (2) additives to the liquor to act as catalysts and increase the action; (3) the control of pH, time, temperature, etc. during the bleaching process; and (4) the type of process (single or multistage) used, whether hypochlorite is used in one or more stages. In conclusion, general reviews on pulp bleaching are listed. 2 tables and 90 references. E.S.

BOARD

ANON. New hardboard process. Chem. Eng. 60, no. 1: 138, 140, 142 (January, 1953); *cf.* B.I.P.C. 22: 212-13, 450.

A new semidry process developed by Plywood Research Foundation and licensed to Anacortes Veneer, Inc. at Anacortes, Wash. is described. The new product (known as Armorbord) is made solely from old-growth Douglas-fir without bark, although other types of wood could also be employed. The material is chipped, softened under steam pressure, fed to a continuous cooker, where 1-3% wax size is added, ground after discharge in two mechanical grinders, mixed with 1-3% of a thermosetting resin in a continuous blender, and fed to a specially designed felting machine, where the fibers are deposited by air. The mat emerging from the felter is 6 to 10 inches in thickness; a compressor reduces its size to about 3 inches before it is cut and pressed in a conventional hardboard press for 8 to 10 minutes at 325 to 373°F. Almost the entire process is automatic; the resulting product is tough and flexible. 5 figures. E.S.

ELMENDORF, ARMIN. Manufacture of hardboard out of wood waste. J. Forest Products Research Soc. 2, no. 4: 7-9 (November, 1952).

The unique characteristics or properties of hardboard which distinguish it from other wood fiberboards are reviewed. Granular wood hardboard made from sawmill wastes is described, and the economic considerations in establishing such a hardboard mill are discussed. Descriptions of the following major manufacturing processes, along with an analysis of their cost, are given: the continuous wet process, the batch wet process, the semidry batch processes, continuous wet felting with dry pressing, and the dry process. 3 tables. L.C.

LEWIS, WAYNE C. The hardboard industry in the United States. J. Forest Products Research Soc. 2, no. 4: 3-6, 68 (November, 1952).

Some of the problems resulting from the present mushrooming growth in the hardboard industry are outlined. Hardboard is defined and described and its properties are given. The basic manufacturing processes, the specifications for hardboards, the influence of hardboard on wood utilization, and the future possibilities of the industry are also discussed. 3 tables. L.C.

BOARD—SPONTANEOUS COMBUSTION

HÄGGLUND, A. Some aspects of the fire hazards and protection during the hot processing of wood fiberboards. Svensk Papperstidn. 55, no. 23:879-84 (Dec. 15, 1952). [In Swedish]

The author reviews the important factors which may result in the self-heating of fiberboards during drying and hot processing (including oil impregnation and heat processing). This treatment is carried out in drying chambers or continuous tunnel driers through which the boards travel either in suspended condition or lying flat in such a manner that an air current can be directed over both sides of the boards. The most common hazards include: uneven distribution of the cooling air or insufficient rate of air flow, uneven moisture distribution in the boards, forced drying, poor cooling installations, admittance of air in the incorrect place, change in the board furnish, static electricity, and spark formation through mechanical friction. The following possibilities for the reduction of fire risks in board-processing equipment are listed: The rate of turbulent air flow over the plates must be sufficiently large; suitable arrangements for directing the air current (fans) must be installed. The heating units should be provided with flat surfaces, including smooth flanges, so that no dirt can become lodged. Automatic temperature recording and control are essential. The cooling with water in the final stage of heat processing must also be carried out automatically. All metal sections of the drier must be properly grounded. No spark-forming material should be used in the construction of the blower fans. Constant supervision during operation and correct continuous maintenance are necessary. Since some of the substances expelled from the boards during treatment may form explosive mixtures with the circulating air, safety valves for prohibiting the building up of dangerous pressures must be provided. All sections of the drier should be readily accessible, so that ignited material can be removed with ease. Automatic alarms for signalling the stoppage of the fans or the outbreak of a fire must be installed. Fires should be fought with carbonic acid, not with steam, and manually applied, finally distributed water or water mist. 4 figures and 11 references. E.S.

BOARD, CORRUGATED

SKIVER, F. E. High-low corrugations. Tappi 36, no. 1: 54A, 56A (January, 1953); Fibre Containers 38, no. 1: 30, 35 (January, 1953).

High-low flutes are recognized as flutes which are irregular or uneven in height as the web or single-face comes off the corrugator; they affect both top-to-bottom and end-to-end compression about an equal amount and subsequently affect boxmaking operations. Higher pressure is required on the printer-slotters and the taper; this crushes the corrugations and defeats the goal of a good tape bond. The way in which three main factors—material, equipment, and the operator—affect high-low flutes are described. A good corrugating medium, and attention to moisture, caliper, constant tension, even winding, and freedom from foreign material and bad edges are essential, in addition to good conditioning and showers, springs which supply uniform pressure, and operators who are trained to compensate for any variables. L.C.

VANDER MEULEN, C. R. Warping and washboarding. Tappi 36, no. 1: 44A, 46A, 48A, 50A, 54A (January, 1953); Fibre Containers 38, no. 1: 35-6, 38, 40 (January, 1953).

Washboarding and normal, lengthwise. reverse, diagonal, and "S" warping are defined. Warped board is difficult and sometimes impossible to run through the printer slotter, and washboarding results in poor printing jobs, loss in flat crush strength, and difficulties in the case-sealing operation. The little research which has been done on warping indicates that it is caused by variations in dimensional stability resulting from unbalanced moisture content in the board components; suggestions for corrective measures in this regard have been highly controversial, however. An analysis of warping resulting from the conditions of heating and steaming which prevail on a corrugator is given. Suggestions for controlling warping are made, four of them centering about the employment of preheaters. Washboarding is caused by a dimensional disturbance parallel to the machine direction of the paper. The factors which contribute to this condition are described. The application of less adhesive, the use of higher solids in the adhesive, the reversal of the liner, and the use of a harder sizing are advocated as helpful in minimizing the defect. 3 references. L.C.

BOARD MILLS

ANON. The fiberboard mill at Vrena. Svensk Papperstidn. 55, no. 23: 917-19 (Dec. 15, 1952). [In Swedish]

The installations of the new fiberboard mill at Vrena are described; thinnings, cullwood, and sawmill waste are converted in six Defibrators and a sheet-forming machine to plates of the required size, which are then pressed in a hydraulic press and subjected to a hot-processing treatment. 6 illustrations. E.S.

FIBRE CONTAINERS. Certain-teed's new Oklahoma mill. Fibre Containers 37, no. 12: 74, 76, 78, 83-4 (December, 1952); *cf.* B.I.P.C. 23: 237.

The buildings, equipment, and capacity of Certain-teed Products' new 100-ton gypsum-board mill at Pryor, Okla. are described. 1 flowsheet and 12 illustrations. L.C.

PULP & PAPER. Oklahoma paperboard mill. Pulp & Paper 27, no. 1: 46-8, 103 (January, 1953); *cf.* B.I.P.C. 23: 237.

The new paperboard mill of Certain-teed Products Corp. at Pryor, Okla. is described. 1 flowsheet and 16 illustrations. E.S.

BOARD MILLS—DIRECTORIES

FIBRE CONTAINERS. Official board mill directory. Fibre Containers 37, no. 12: 114, 116-18, 120-4, 126-39, 142-5 (December, 1952); *cf.* B.I.P.C. 22: 317.

The annual directory of board mills in the United States and Canada is presented, including sections for regular and specialty board mills; the U. S. mills are listed by states. An alphabetical list of board-mill companies is also given. L.C.

BOARD SPECIALTIES

ANON. 24-Bottle take-home beverage carrier. Fibre Containers 37, no. 12: 93-4 (December, 1952).

Two 24-bottle beverage carriers made by Gaylord Container Corp. and River Raisin Paper Co. are described. The Gaylord carrier is fabricated in three pieces, bottom pad, body, and handle, and the River Raisin version is of two-piece construction with a "strut" type handle separate from the case proper. Both types are of lightweight weatherproof solid fiberboard. The steps in the fabrication of each are given, and their sales and economy advantages are discussed. 2 illustrations. L.C.

CROOK, PAUL J. Expendable pallet pack system. Packaging Parade 21, no. 240: 93-4 (January, 1953).

The "Power Pack," an expendable pallet of corrugated board used for engine packing, is described. Reductions in cost of materials, storage space, shipping weight, and handling costs are ascribed to its use. 4 illustrations. L.C.

BOARD TESTING—PHYSICAL

HIGGINS, J. J. Printability of boxboard. Pulp Paper Mag. Can. 53, no. 13: 106-8 (December, 1952); Fibre Containers 38, no. 1: 98, 100 (January, 1953); *cf.* B.I.P.C. 22: 815.

The author describes the methods in use at the Ohio Boxboard Co. for measuring the smoothness, compressibility, oil receptivity (uniformity and level of oil absorption), and surface bonding for the evaluation of the printability of boxboard. 3 diagrams. E.S.

LONG, F. D., and MALTENFORT, G. G. A new test for corrugating medium. Fibre Containers 37, no. 12: 86, 91-2 (December, 1952).

A test is described in which a special device is used to produce a fluted sample from a 6-inch specimen of corrugating medium; this sample is suitable for judging the quality of the medium. The correlation between this test and the flat crush of combined board is very high. No conditioning time is required after fluting the specimen, so that it is possible to run between 130 and 180 tests an hour, depending on the test level of the medium. This circumstance, together with the fact that every mill using the test has found it very sensitive to changes on the paperboard machine, makes it an ideal tool for production quality control. The specimen is crushed on the conventional Hinde & Dauch flat-crush tester. Since the results produced are at a higher level than all other present medium tests, the inability to read gages closer than to the nearest pound affects this test proportionately much less. 2 tables and 3 figures. L.C.

BONDED FIBER WEBS

SHEARER, HOWARD E. Methods of producing bonded-fiber fabrics. Am. Dyestuff Reptr. 41, no. 26: P874-9 (Dec. 22, 1952).

The author points out the range of physical properties which may be built into bonded-fiber fabrics and discusses the basic principles which form the foundation of their construction. These features are obtained through many novel arrangements of existing textile equipment as well as through the use of new machines specially developed for this purpose. Equipment for carrying out these operations by various means is described in relation to its use with fibers of different types, bonding media, and product features. 1 table, 10 figures, and 31 references. E.S.

CARBOHYDRATES

JONES, J. K. N. Generalizations on the chemical structure of the

monoses, the oligosaccharides, and polyoses (glucose, fructose, maltose, cellobiose, cellulose, starch, and glycogen). Assoc. tech. ind. papetière, Bull. 6, no. 4: 149-56 (October, 1952). [In English; French summary]

A general paper is presented in which experimental evidence and deductions leading to the accepted structural representations of the above compounds are recounted. 25 figures. E.V.W.

CELLULOSE

STAMM, ALFRED J. Recent advances in wood chemistry. Paper Ind. 34, no. 10: 1233-4 (January, 1953).

A summary of recent advances in wood chemistry, especially cellulose chemistry, is presented, including cellulose structure, fractional precipitation in degree-of-polymerization studies, fiber strength and chain length, x-ray and electron-microscopic studies of crystalline and amorphous regions, and accessibility of cellulose. E.S.

CELLULOSE—DEGRADATION

EMERY, CONSTANCE, and COHEN, W. E. Chain-length distribution studies on nitrated wood and cotton celluloses. Australian J. Appl. Sci. 2, no. 4: 474-87 (December, 1951).

Experiments with nitrates of wood and holocellulose from *Eucalyptus regnans* F.v.M. are described, which show that no support can be lent to the theory of periodic acid-sensitive linkage in the cellulose molecules, as postulated by Schulz (*cf.* B.I.P.C. 18: 821). Preliminary results by the fractional-solution technique without refractionation, ignoring the degree of esterification, and with indefinite periods of storage of fraction solutions, were not substantiated, when the precipitation technique was used and the necessary regard taken of the various influencing factors. A disregard of the variation in the degree of esterification among fractions can cause very great errors in viscosity-distribution curves. Evidence has been obtained in support of the observations of Banderet and Rånby (*cf.* B.I.P.C. 18: 83) that cotton cellulose on acid hydrolysis breaks down to units having a D.P. of 100. The separation of nitrate fractions by the precipitation technique proceeds according to the manner predicted by the Schulz equations only, when the parent material is of low average molecular weight—e.g., acid-hydrolyzed cotton. When materials of high average molecular weight and uncertain substitution are used, separation of fractions does not proceed upon the basis of either nitrogen content or viscosity, but depends in a complex way upon both of these, and probably upon other unknown factors. It seems therefore that for the time being one should hesitate before applying the precipitation technique to determine molecular-weight distribution in cellulose derivatives of high-molecular weight and uncertain substitution. 1 table, 7 figures, and 27 references. E.S.

PAGÉ, EDGAR J. The fractionation of cellulose. Textile Research J. 23, no. 1: 28-33 (January, 1953).

Studies of molecular-weight heterogeneity have been carried out on various celluloses, both before and after exposure to the degradative effect of ultraviolet radiation. Fractionation was carried out on the nitrate derivatives of the samples studied. The data show that significant changes have taken place in the molecular-weight distribution patterns of the degraded celluloses; both cotton cellulose and tire-cord viscose rayon exhibit minor distribution peaks

at the lower D.P. end of the scale. This low D.P. concentration occurs in the neighborhood of 235 D.P. for cotton cellulose and at approximately 76 D.P. for degraded cellulose from viscose rayon. These values are in substantial agreement with the values for "limit cellulose" as presented by Mehta and Pacsu (*cf.* B.I.P.C. 19: 9). Their values were D.P. 256 for cotton cellulose and D.P. 64 for regenerated celluloses. These are the limiting values derived by mild acidic hydrolysis of cotton cellulose and regenerated cellulose. Whether or not the occurrence of these minor distribution peaks in the ultraviolet-degraded cellulose is open to the same or to an analogous interpretation as the data of Mehta and Pacsu is problematical. Nevertheless, the occurrence of similar peaks at approximately the same points in the D.P. range does present a striking analogy still to be investigated. 2 tables, 9 figures, and 22 references. E.S.

SCHULZ, G. V., and KÖMMERLING, I. Molecular-weight distribution and weak links in celluloses investigated by Emery and Cohen. Makromol. Chem. 9, no. 1: 25-34 (December, 1952). [In German]

The authors have reinterpreted the chain-length distribution studies of Emery and Cohen (*cf.* abstract above). They use the experimental viscosity data of these workers, but do not correct for the nitrogen content of the cellulose nitrate fractions. Emery and Cohen interpreted their results to show random distribution of chain length in hydrolyzed cellulose, except for a maximum around a D.P. of 100 which they attribute to factors of fine structure rather than to molecular irregularities. The present authors, on the other hand, believe a correction for nitrogen content to be unwarranted, basing their belief on their own work. Their evaluation of the uncorrected data of Emery and Cohen leads them to conclude that weak links are present at approximately every 465th glucose unit, at variance from the views of Emery and Cohen. 7 tables, 8 diagrams, and 9 footnotes. K.W.,Jr.

CELLULOSE—HEMICELLULOSE

JONES, J. K. N. Modern methods of studying the polyoses. Application in the study of certain hemicelluloses. Assoc. tech. ind. papetière, Bull. 6, no. 4: 157-61 (October, 1952). [In English; French summary]

The mixture of sugars and sugar acids obtained upon partial hydrolysis of aspen sawdust (*cf.* B.I.P.C. 23: 10) and the holocellulose prepared therefrom has been investigated by paper-partition chromatography. Rhamnose, arabinose, xylose, mannose, glucose, galactose, oligosaccharides, and various spots resulting from the presence of acidic materials were identified. The presence of a xylanlike polysaccharide in the original wood is indicated. Glucuronic acid, 4-methyl-glucuronic acid, and galacturonic acid were identified in the acidic components. An aldobiuronic acid was also isolated and shown to be a glucuronic acid joined glycosidically to the 2-position of a xylose molecule. From these data and oxidation experiments on the original hemicellulose, deductions are made as to the structural character of aspen hemicellulose. 9 figures. E.V.W.

WISE, LOUIS E., and BUCHANAN, M. A. The chemistry of the cellulosic wood fiber. Paper Ind. 34, no. 10: 1229-32 (January, 1953).

The authors review the chemistry of wood cellulose and its difference from that of cotton cellulose. Particular attention is paid to several aspects of the hemicelluloses, their correlation with acetyl groups, and recent ad-

vances in the field (many of these based on studies carried out at The Institute of Paper Chemistry), such as molecular magnitude, the possibility of preparing a homogeneous hemicellulose fraction, hardwood and softwood hemicelluloses, and their importance in pulps. 4 figures and 25 references. E.S.

CELLULOSE—SOLUBILITY

JOHNSON, ARTHUR F., and MUELLER, WILLIAM A. Effect of Wiley mill cutting on solubility of cellulose fibers. Ind. Eng. Chem. 45, no. 1: 215-17 (January, 1953).

This work was undertaken to determine the influence of the gross fiber structure on the solubility of cellulose in alkaline solution. Fibers were cut in a Wiley mill to destroy the gross fiber structure, and the resulting powder was separated with standard sieves into various particle-size ranges. The results of solubility determinations on the powdered materials using 2.75 *N* sodium hydroxide as a solvent can be expressed as a linear relationship between solubility and (particle size)$^{-1}$. For example, with one sample of cotton linters, the relationship was: % solubility $= 0.81 + 0.115\ (1/d)$, where d is the sieve-mesh opening in millimeters. Both parameters of the equation are shown to be strongly influenced by chemical or physical treatments of the fibrous material. In attempting to characterize cellulose by solubility measurements, it is thus essential to determine not only the solubility of the fibrous material but also the slope of the solubility *vs.* (particle size)$^{-1}$ curve. 3 tables, 2 figures, and 4 references. E.S.

CELLULOSE ESTERS

MALM, CARL J., TANGHE, LEO J., LAIRD, BARBARA C., and SMITH, GLENN D. Relative rates of acetylation of the hydroxyl groups in cellulose acetate. J. Am. Chem. Soc. 75, no. 1: 80-4 (Jan. 5, 1952).

Several samples of hydrolyzed cellulose acetate, 30-40% acetyl, were reacetylated under a variety of reaction conditions. Most of the reactions were carried out without a catalyst, using acetic anhydride as the acetylating agent. Variations were made in the temperature and in the amount of anhydride. Catalysts were also investigated, including sulfuric acid, perchloric acid, zinc chloride, and pyridine. Finally, acetylations were made with acetyl chloride and pyridine. The relative reactivities of the primary and secondary hydroxyls were calculated from the total amounts of hydroxyl and the amounts of primary hydroxyl in the products taken during the course of these acetylations. The primary hydroxyls were always more reactive than the secondary. In general, factors which accelerated the reaction diminished the difference in reactivity between primary and secondary hydroxyls. Thus in the uncatalyzed reaction with acetic anhydride at room temperature, the primary hydroxyls reacted 10 times as fast as the secondary, whereas in the reaction catalyzed with sulfuric acid they reacted only two and one-half times as fast. Optical rotations throughout these acetylations correlated with the amounts of primary hydroxyl and the acetyl contents. 2 tables, 5 figures, and 9 references. E.S.

CELLULOSE ETHERS

COHEN, SAUL G., HAAS, HOWARD C., FARNEY, LEONARD, and VALLE, CLAUDE, JR. Preparation and properties of some ether and ester derivatives of hydroxyethylcellulose. Ind. Eng. Chem. 45, no. 1: 200-3 (January, 1953).

Methods for preparing ether and ester derivatives from hydroxyethylcelluloses containing from 0.4 to 1.5 moles of combined ethylene oxide per anhydroglucose unit were investigated and are described. Hydroxyethylcellulose undergoes substitution reactions more readily than cellulose; the esterifications proceed more rapidly and smoothly and with less degradation than the etherifications. Unlike cellulose, it is possible to prepare partially acylated derivatives directly. Good agreement was obtained when the derivatives were analyzed both by carbon and hydrogen determinations and by the further acetylation of residual hydroxyl groups. The derivatives were further characterized by viscosity measurements and solubility behavior. Other data collected include softening points, moduli of flexure, brittle temperatures, and stress-strain behavior. Where possible, correlations have been made between the type of substituent and the polymer properties. The derivatives in general are good film formers and in many ways are superior to the corresponding cellulose derivatives. The data which are presented allow comparisons to be made with available data on other polymeric materials. 6 tables and 13 references. E.S.

VAUGHN, THOMAS H., SUTER, H. R., and KRAMER, M. G. Detergency and foaming properties of the system alkylarylsulfonate-soap-sodium carboxymethyl cellulose. J. Am. Oil Chemists' Soc. 30, no. 1: 1-5 (January, 1953).

A study has been made of the detergency and foaming characteristics of a ternary system comprising a sodium alkylarylsulfonate, a medium-titer soap derived from tallow and coconut oil, and sodium carboxymethylcellulose under average conditions prevailing in household laundering. The carbon soil removal and whiteness retention properties of unbuilt soap are equalled or exceeded in compositions containing approximately five parts of soap to one part of the sulfonate, with a minor portion of the carboxymethylcellulose. The latter does not affect foaming properties significantly when used in the proportions desirable for the improvement of detergency. The data show that compositions of excellent detergency and foaming characteristics may be formulated from the above ternary system, which will be suitable for different types of washing machines used under average conditions prevailing in household service. 1 table, 6 figures, and 8 references. E.S.

CHEMICAL TESTING—CELLULOSE—ACCESSIBILITY

BORGIN, KARL. Determination of the suitability of different celluloses for the manufacture of cellulose derivatives. Norsk Skogind. 6, no. 11: 373-8 (November, 1952). [In English; Norwegian summary]

For determining the suitability of celluloses for the conversion to derivatives (cellulose acetate, cellulose nitrate, cellulose xanthate, etc.), it is essential to characterize the material with regard to its reaction-kinetic behavior and its accessibility to the different reagents. The cellulose must possess a satisfactory reactivity, and its accessibility must be as high as possible. It is much more desirable to prepare a reactive cellulose than one of high chemical purity—e.g., with high alpha and low rosin content, good whiteness, etc. It is therefore exceedingly important to develop methods which will indicate the suitability of a cellulose for the preparation of derivatives. The existing scientific and technical studies show a great uncertainty with regard to suitable methods and conclusions to be drawn from their results. The confusion in terminology concerning reactivity and accessibility contribute further to the problem. The author postulates that the suitability of a cellulose for the preparation of derivatives is not a single property which can be numerically expressed by a single factor or by a simple experimental determination. It is de-

termined by many complex reactions and properties of cellulose, including the following factors: reactivity, average rate of reaction, rate distribution, sensitivity (change of the average rate of reaction with change in experimental conditions), and accessibility. These properties are defined and their relationship to the evaluation of a cellulose are described. Accessibility is shown to comprise three different types: (*a*) the ratio between amorphous and crystalline regions, (*b*) the relative accessibility, and (*c*) the total accessibility. Of all the factors under discussion, the total accessibility is shown to be the most important property for commercial conditions. A low total accessibility will cause turbid solutions, filtering difficulties, and microgel structures with the corresponding thixotropy of spinning solutions. Even if the other properties, reactivity included, are excellent, the cellulose will lose its commercial value, if the total accessibility is too low. A method for determining total accessibility should therefore be developed and internationally accepted. 5 figures and 24 references. E.S.

CHEMICAL TESTING—PULP—CELLULOSE

SIMMONS, J. R. The chemical nature of the alpha, beta and gamma fractions of bleached coniferous chemical wood pulps. World's Paper Trade Rev. 138, no. 23: 1766, 1768, 1770-2, 1777 (Dec. 4, 1952); Paper-Maker (London) 124, no. 6: 497-8, 500, 502, 506 (December, 1952).

The author attempted the chemical analysis of α-, β-, and γ-cellulose in terms of the natural hemicellulose constituents. Using specially devised or adapted methods of analysis, it is shown that the α-fraction consists chiefly of normal cellulose with some residual hemicelluloses; the β-fraction consists of degraded cellulose with some occluded hemicelluloses, and the γ-fraction consists largely of hemicelluloses. The results also suggest that by modifications of existing procedures, it might be possible to effect a better separation of the three fractions. A description of the analytical methods employed in this study is appended. 5 tables and 5 references. E.S.

CHEMICAL TESTING—WHITE LIQUOR

BORLEW, PETER B. Control tests. Paper Mill News 76, no. 2: 34-6 (Jan. 10, 1953); Pulp Paper Mag. Can. 54, no. 1: 94-7 (January, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952. The author discusses the double-titration control test for determining the principal constituents of the green and white liquors (*cf.* B.I.P.C. 23: 242) and the variety of interpretations which is possible from its data. 16 references in the second article. E.S.

CHEMICAL TESTING—WOOD

ENKVIST, TERJE, and LINDBERG, JOHAN. Laboratory apparatus for extraction of wood chips with volatile solvents. Paper and Timber (Finland) 34, no. 12: 464-6 (December, 1952). [In Swedish; English summary]

An apparatus for the extraction of large quantities of wood chips is described which can be assembled at low cost from ordinary laboratory ware and readily available glass sections. One kg. of chips can be thoroughly extracted with acetone in about 15 hours. The apparatus has so far been employed for the extraction of spruce and birch chips and straw with acetone, but other volatile solvents can be used as well. The operation is entirely automatic; the dimensions and details of the assembly can be modified to suit special conditions. The extracted resin solution can be drained

at frequent intervals soon after the extraction has started, so that it need not be exposed to high temperatures for any length of time. 2 diagrams and 2 references. E.S.

CHIPS

ANON. Arkansas sawmill serves Crossett. Pulp & Paper 27, no. 1: 73-4 (January, 1953).

Production of clean chips from material formerly lost as wood waste for shipment to a paper mill has been successfully demonstrated on a commercial scale by the Southern Lumber Co., Warren, Ark. The pioneering installation at Warren consists of an Andersson mechanical log barker, vibrating screen, and chipper to which the clean slabs and trimmings are fed. The chips are conveyed by box cars to Crossett Paper Mills and drawn from the car with a 16-inch suction pipe; the cars contain an average of 19 cords each, or a little better than one digester cook. A 120,000-cu. ft. capacity concrete chip bin has been erected at Crossett. The chips from Warren are slightly smaller than those produced in the mill's chipping installation, but are considered satisfactory. They are fed to the digesters together with mill chips. It is expected that similar installations will be erected within the southern pine-producing area. 9 illustrations. E.S.

MAUERMAN, V. L. Chipping of wood waste for the kraft process. Can. Pulp Paper Ind. 6, no. 1: 12, 14 (January, 1953).

Wood waste previously burned or otherwise discarded which is now used as a raw material in kraft mills comprises second-growth thinnings, prelogged and relogged timber, broken logs not suitable for lumber or those containing some rot and stain in addition to sound fiber, veneer chips, and sawmill waste. The largest percentage of wood for the Weyerhaeuser kraft mill at Longview is obtained from the last-named source; the problems presented by the handling and chipping of this wood are discussed. Chip length before screening becomes more variable than when whole logs or cants are chipped, so that more screen capacity is required; the oversize chips may be burned or rechipped. The chipper knives and anvils must be kept sharp and close together to prevent bouncing of the small wood; a side anvil was found to provide more uniform chips. Grease rags, gloves, etc. discarded in the sawmill may cause trouble; tramp metal is one of the principal sources of chipper damage. A combined method of metal detection with a magnetic pulley on top and a Rens metal detector under the wood-feeding belt has given satisfactory results, although an alert chipper feeder is still a necessity. 1 table. E.S.

UHLIG, GUY E. Chip screen analyses. Tappi 36, no. 1: 99A (January, 1953).

The author criticizes the usual incompleteness of chip-screen data; their interpretation is difficult, because the evaluation should be carried out in a more systematic manner. He recommends the following interpolating expression: $Y = ABn^x$, in which Y is the fraction retained on a screen opening of size x, A and B are constants depending upon the experimental data, and n represents a series of continuing exponents whose number is such that there are as many constants as there are screens in the set. E.S.

CHLORINE

CHEMICAL AND ENGINEERING NEWS. More chlorine for U. S. goal of new plant. Chem. Eng. News 31, no. 3: 258-9 (Jan. 19, 1953).

A pictorial presentation with brief text on the new Muscle Shoals, Ala. plant is presented. It employs De Nora cells for the electrolytic decomposition of salt in the manufacture of liquid chlorine, hydrogen, and sodium hydroxide. Each cell can make about 1.7 tons of 70% sodium hydroxide, one ton of chlorine, and 10,000 cu. ft. of hydrogen per day; for this output, about 1.7 tons of salt, water, and 3100 kw.-hr. of electric power are required. 8 illustrations. E.S.

COLOR-BLINDNESS

SCHMIDT, INGEBORG. Effect of illumination in testing color vision with pseudo-isochromatic plates. J. Optical Soc. Am. 42, no. 12: 951-5 (December, 1952).

The intensity and the spectral energy distribution within ranges found in natural daylight have a certain effect on the interpretation of pseudo-isochromatic plates. A variation of illumination between 270 and 1000 lux affects color defectives; the error percentage on plate tests decreases slightly with higher illuminations. This decrease is chiefly found in deuteranomalous subjects. The color temperature of the illumination affects the number of errors made by both normals and color defectives. As the color temperature is increased, the error percentage increases slightly in normals, distinctly in deuteranomalous subjects, and less noticeably in deuteranopes. Protanomalous and protanopic subjects do not show a significant effect. On the average, the same percentages of errors result when either a Macbeth easel daylight lamp or a fluorescent daylight lamp is used for the illumination of the plates, provided the same intensity is present. It is recommended that only artificial daylight of a standardized color temperature and intensity be used to obtain comparable results in pseudo-isochromatic tests. 3 tables, 1 figure, and 17 references. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating. Article 5. Time-cost relationships and reporting. Boxboard Containers 71, no. 721: 38-40 (January, 1953); *cf.* B.I.P.C. 23: 324-5.

A complete set of production cost data for the boxboard container manufacturer must include information on the time required for each operation, as well as on the machine and process-hour labor costs of each part of the conversion process. Nonproductive labor costs must be separated from those of direct productive labor through the analysis of employees' time reports and must be compared with productive time for determining relative efficiency. The elements of a good time-reporting system are outlined, and the importance and application of an efficiency factor based on production-time standards are discussed. 4 illustrations of labor time reports, including a punched card. L.C.

DIELECTRICS—TESTING

S.W. Instrument for measuring the breakdown voltage. Svensk Papperstidn. 55, no. 23: 916 (Dec. 15, 1952). [In Swedish]

An instrument for measuring the breakdown voltage of electrical insulating paper is described; it was developed in Pappersbrukens Centrallaboratorium. 2 figures. E.S.

DIGESTERS

KELLY, HAL J., MAINHARDT, ROBERT, and STRANDBERG, KARLE G. Factors influencing premature failure of ceramic digester linings in sulfite pulp mills. J. Am. Ceram. Soc. 36, no. 1: 18-26 (January, 1953).

The purpose of the present investigation was the determination of the characteristics of sulfite-digester lining brick which cause premature failure and of the qualities which will best withstand the destructive forces within the digester. The effects of acid attack, mechanical stresses, cyclic changes in temperature and pressure, and chemical and physical changes of the brick during the service were studied and the following conclusions were drawn: The cooking acid under elevated pressure and temperature attacks the brick structure, leaching alumina, silica, and iron from the clay. The extent of solution of the alumina is a function of the firing temperature; higher firing temperatures decrease the solubility. A brick with a compressive strength of at least 4000 lb./sq. in. is necessary to meet the mechanical stresses in the digesters. Residual cooking liquor in the brick during service is an effective bond at atmospheric temperature. Standard digester brick, as used at present, meet the requirements best when the bulk density is 2.17 or more, and the modulus of elasticity is 2.6×10^6 or more. Repeated thermal dilations caused by cyclic temperature changes are more destructive to the poorly bonded brick than to one of the same composition fired to a higher temperature. Wide variations in acid solubility and crushing strength can be reduced by higher and better-controlled firing than is now employed. Better digester brick must be carefully balanced between a vitrification and porosity obtainable for this particular use by careful firing only. A completely vitrified brick, although strong and acid resistant, will not withstand the cyclic thermal changes. However, it must be sufficiently vitrified to withstand the high compressive stresses and attack by strong acids and must be sufficiently elastic to withstand many thousands of thermal dilations. Brick prepared in the laboratory on the basis of these conclusions has been tested in simulated digester conditions with satisfactory results; however, the final judgment can be reached only after five years of actual service in a digester wall. 10 tables, 10 figures, and 3 references. E.S.

KENNEDY, STEVE. Some ideas on digester instrumentation. Paper Mill News 76, no. 2: 32-3 (Jan. 10, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952, in which the author describes the instrumentation and control of a sulfate digester. E.S.

PANDIA, INC., *New York.* [The Pandia discharger] Tappi 36, no. 1: 97A (January, 1953); Southern Pulp Paper Manuf. 16, no. 1: 83 (January, 1953).

A new piece of equipment is described whose function is the continuous and uniform discharge of pulp from the Chemipulper continuous digester to the atmosphere at a constant rate. It will be a component part of all new Chemipulper installations. The discharger can be installed on existing Chemipulpers and will operate satisfactorily with any of the usual cellulosic raw materials used in the paper trade. It will not be employed to any great extent in the felt industry where the Chemipulper continuous digester is widely used in conjunction with the Asplund Defibrator. 1 illustration. E.S.

WHITESIDE, GEORGE. Digester room equipment. Paper Mill News 76, no. 2: 18-19 (Jan. 10, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952. The author describes standard digesters and Chemipulper units, circulation systems, and the corrosion and instrumentation of sulfate digesters. E.S.

DRYING

MARSHALL, W. R., JR. Drying. Ind. Eng. Chem. 45, no. 1: 47-54 (January, 1953); *cf.* B.I.P.C. 21: 392.

Sections on infrared and high-frequency drying, drying fundamentals, and the drying of textiles and paper are included in this two-year general review of the literature on drying. 1 illustration and 232 references. E.S.

DYES AND DYEING

THE GEIGY COMPANY, LTD., *Manchester, England.* Tinopal in the paper industry. World's Paper Trade Rev. 138, no. 21: 1626, 1628, 1630 (Nov. 20, 1952).

The different fluorescent brightening agents developed by the company under the registered trade names Tinopal BV, Tinopal 2B, and Tinopal RSP and their suitable applications in the paper industry are described. E.S.

ENGINEERING

FREEMAN, NEWELL L. Registration of professional engineers. Tappi 36, no. 1: 64A, 66A, 68A (January, 1953).

Following a brief discussion of the purpose of registration and the advantages to the individual engineer accruing therefrom, an outline of the procedures involved in the application is given, including information on written examinations required by many states. A list of the addresses of registration boards in different states is appended. E.S.

ESPARTO

ANON. Baling of esparto grass. World's Paper Trade Rev. 138, no. 24: 1822, 1824 (Dec. 11, 1952); Paper-Maker (London) 124, Annual no.: 30 (1952).

The baling of esparto grass in North Africa has hitherto been done by uneducated Arab labor by the most primitive methods, which have not changed since the beginning of the trade in 1865. One of the largest North African producers of esparto, Société Algero-Tunisienne Alfatière has now installed six new hydraulic presses at Sousse, where the material transported in bales from inland is sorted and cleaned once more, and rebaled in units of uniform size. These presses will considerably improve sea transport, and the handling and stacking conditions at the receivers' mills. 2 illustrations. E.S.

EVAPORATION AND EVAPORATORS

BADGER, W. L., and LINDSAY, R. A. Evaporation. Ind. Eng. Chem. 45, no. 1: 55-8 (January, 1953); *cf.* B.I.P.C. 22: 403.

The literature of the past year on the theory and practice of evaporation is reviewed. Part of one section in the article is devoted to the literature published on the evaporation of black liquor and sulfite waste liquor. 1 illustration and 61 references. L.C.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

BECKER, FOLKE. Sulfite pollution; solutions lie in research—not laws. Pulp & Paper 27, no. 1: 63-4 (January, 1953); *cf.* B.I.P.C. 23: 360.

Essentially the same information as in the previous reference concerning the new evaporator plant at Rhinelander is given. 2 illustrations. E.S.

FEED WATER

WADE, CHAS. F. Feed water thermal storage. Paper-Maker (London) 124, Annual no.: 44-5 (1952).

The author lists the two systems of thermal storage in use at present, the variable-pressure system employing Ruth accumulators (I) and the constant-pressure or feed-water system (II). (II) requires smaller and much less expensive storage vessels than (I) and will appeal to the smaller mills where Lancashire boiler plants still predominate, whereas the more modern boiler designs of the "Economic" class will preferably install (I). The operation and advantage of (II) are described. 2 diagrams. E.S.

YODER, J. D. Demineralization by ion exchange. Paper Mill News 75, no. 49: 83-4, 86, 130 (Dec. 6, 1952).

The effective demineralization of feed water for high-pressure boilers can be accomplished by means of the new ion-exchange resins; the installation in a fine-paper mill is described. The higher the amount of the mineral solids to be removed, the more expensive the demineralizing equipment will be; however, the quality of the treated water justifies the higher cost. 2 tables, 2 flowsheets, and 4 illustrations. E.S.

FIBER—STRUCTURE

ASUNMAA, SAARA, and LANGE, PAUL W. The distribution of the components in the plant cell wall. Part III. Microspectrographic determination of the distribution of periodic acid oxidized regions in the cell wall of holocellulose from spruce. Svensk Papperstidn. 55, no. 24: 936-41 (Dec. 31, 1952). [In English; German and Swedish summaries] *cf.* B.I.P.C. 22: 662.

Following a brief discussion and review of the principles of the periodic acid oxidation of cellulose, the authors describe the oxidation in 70% alcohol with subsequent fuchsin-sulfite staining (*cf.* Hotchkiss, B.I.P.C. 18: 399-400) of holocellulose (I) and hot alkali-treated holocellulose (II) from Swedish spruce for determining the relative distribution of the easily accessible portions of the cell wall. The light-absorption distribution of the stained oxidized areas (i.e., the accessible carbohydrates converted to aldehydes) was then measured microspectrographically, as described in previous papers of this series. The results of the present investigation indicate that most of the easily accessible material is located in (I) in the outer portions of the fiber wall and decreases toward the lumen; the distribution is approximately linear. In (II), where most of the easily accessible parts are removed, the concentration of the oxidized regions is greatest around the lumen and decreases linearly toward the outer parts of the cell wall. The distribution of oxidized material is difficult to interpret quantitatively, but as a very rough approximation it may be stated, that the distribution curve in this case gives a picture of the distribution of the ordered regions (cellulose) in the fiber. Since the oxidation in the present work was carried out with 70% alcohol to prevent the loss of any oxidized low-molecular material through diffusion from the fiber wall, only part of what is normally defined as easily accessible regions of the fiber in the water-swollen state is oxidized. Hence, the results of this work cannot be directly compared with other accessibility investigations carried out in water solution. 8 figures and 23 references. E.S.

COTTRALL, L. G. Influence of chemical composition and morphology of the fibres of mechanical and kraft pulps on their paper making properties. World's Paper Trade Rev. 138, no. 23: 1777-80, 1782, 1784 (Dec. 4, 1952); Paper-Maker (London) 125, no. 1:34-6, 38 (January, 1953).

The papermaking properties of mechanical pulp depend solely on the size and shape of the ultimate units and on the proportion of these, not on the chemical composition of the pulp, although the grinding process itself is affected by the chemical composition of the wood. The papermaking properties of sulfate pulps, on the other hand, are determined both by the chemical composition (degree of cooking) of the ultimate fibers and by their morphology. The effect of the morphology on the papermaking qualities of sulfate fibers is strikingly shown by the differences between Scandinavian and North American kraft (ribbonlike, flexible fibers) and kraft from southern pines, Douglas-fir and western hemlock (solid fibers). The former are more desirable for printing and wrapping grades where high bursting and tensile strengths are required, whereas the latter are satisfactory for coarse wrapping papers and boards, and papers in which resistance to tear, lightness, porosity, and bulk are desirable features. In many instances, blends of the two fiber types will give the most satisfactory results. 5 tables, 1 figure, and 4 references. E.S.

GIERTZ, H. W. The physical structure and chemical composition of wood cellulose fibres, with special attention to papermaking properties. World's Paper Trade Rev. 138, no. 19: 1451-2, 1454, 1459-62, 1464 (Nov. 6, 1952).

The different layers of a wood fiber—i.e., the primary wall and the three layers of the secondary wall—are described from both a physical and a chemical point of view, and special attention is paid to the complicated fibrillar network structure of the primary wall. A thorough study, based upon both chemical analysis and electron micrographs, reveals that the cellulosic material in the fiber wall can be divided into two discrete fractions which possess quite different properties. The cellulose string fraction consists of pure, highly crystalline cellulose. It amounts to about 43% of sprucewood. The hemicellulose fraction consists of different wood polyoses, mostly mannan and xylan. It forms the interfibrillar substance between the cellulose strings and, on account of its amorphous nature, it may swell and is easily accessible to chemical reagents. If slightly modified, the common α-, β-, and γ-cellulose analysis can be used to perform such a separation. The α-cellulose is represented by the cellulose-string fraction; the γ-cellulose is the same as the hemicellulose, and the β-cellulose consists of the string fragments formed by hydrolytic or oxidative degradation. 2 tables, 6 figures, and 13 references. E.S.

FIBERS

GILMOUR, W. A. The bearing of fibre characteristics on the making of straw and esparto papers. World's Paper Trade Rev. 139, no. 1: 48-9 (Jan. 1, 1953); Paper-Maker (London) 124, Annual no.: 28-9 (1952).

The author reviews the practical advantages which can be expected from the elucidation of the fiber structure and chemistry, with the ultimate sheet of paper in view. Examples of practical applications of fundamental chemistry and fiber classification are given which illustrate possibilities in process control. The desirability of more information about the ultimate fibers of esparto and straw to account for their peculiar behavior through the paper-

making operations and their function in the final sheet is indicated. 1 table and 6 references. E.S.

FILTRATION

MILLER, S. A. Filtration. Ind. Eng. Chem. 45, no. 1: 68-73 (January, 1953); *cf.* B.I.P.C. 22: 412.

The author reviews the literature of the past year on filtration theory, processes, and equipment. The process-applications section includes references to groundwood pulp and broke handling and sulfate and sulfite pulp washing. 3 illustrations and 221 references. L.C.

FINISHING ROOM

BINGHAM, SAMUEL A., JR. Consider the "Do" in the finishing department. Southern Pulp Paper Manuf. 16, no. 1: 42 (January, 1953).

The author emphasizes the need for improving the positive output of the machinery and workers in the finishing room where most of the operations involve unprofitable materials handling. He claims that large savings could be made by such improvements. E.S.

FLUID DYNAMICS

WEINTRAUB, MURRAY, and LEVA, MAX. Fluid dynamics. Ind. Eng. Chem. 45, no. 1: 74-82 (January, 1953); *cf.* B.I.P.C. 22: 405.

The literature of 1952 on fluid dynamics is reviewed in the following sections: flow through equipment, packed beds and porous media, fluidization, nonlinear flow, viscosity and its measurement, flow metering and control, and compressible flow. 299 references. L.C.

FOLDING BOXES

SHAMSKI, WILLIAM E. "What I expect of my folding carton supplier." Am. Boxmaker 42, no. 1: 15, 17 (January, 1953).

Some of the basic requirements of the department store in respect to its folding-carton supplier include: the strict observance of delivery dates and quality specifications; instruction of the retailer on new packaging developments and on the appropriate uses of each type of box; a willingness to warehouse portions of a box order; and the promotion of printing and coloring improvements. L.C.

FORESTS AND FORESTRY

BISHOP, L. L. Southland's forest management policy. Newsprint Service Bur. Bull. no. 419: 6-7 (December, 1952).

The forest-land ownership and management policy and program of Southland Paper Mills are outlined. As much as 10% of the mill's pulpwood requirements is in the form of salvage material; the use of sawmill waste and hardwood pulp for newsprint is being studied. Although practically all pulpwood is produced by private contractors, the company maintains a small wood production force as a safeguard. The wood-handling process at the mill is entirely mechanized. E.S.

NORTHEASTERN WOOD UTILIZATION COUNCIL. Pulpwood from small woodlands. Northeastern Wood Utilization Council, Bull. no. 40: 7-77 (January, 1953).

Pulpwood production on farms and other small holdings was the subject of a conference held by the Council in co-operation with the Pulp and Paper Research Institute of Canada. The papers and summaries of the discussions make up this bulletin. It was stressed that an avoidance of clear cutting is the only way to assure the future supply of pulpwood; many pulp companies are accomplishing this by shifting their buying from agents and contractors who are not interested in forestry, to woodlot owners who are willing to apply the methods prescribed by mill foresters. Portable chippers are also discussed, as well as the problem of bark separation. Full coverage of the latter topic is reserved for a future bulletin on chipped wood for pulp. The papers are listed by author and title: Baldwin, Henry I. Integrated logging: key to stand improvement—9 references, p. 7-15; discussion, p. 15-16; McGuire, John R. What will the pulp mills buy, p. 17-22; discussion, p. 22-5; Holt, Leif. Pulpwood from improvement cuttings, p. 27-37; discussion, p. 37-9; Wilson, M. R. Pulpwood procurement combined with woodlot conservation, p. 41-8 (*cf.* B.I.P.C. 22: 907-8); Simmons, Fred C. Harvesting pulpwood on small holdings, p. 49-59; discussion, p. 59-62; Belcher, R. Gregory. Control of cutting practice, p. 63-71; discussion, p. 72-3; Hicks, Halsey M. Serving the small landowner, p. 75-7. Tabulated data, diagrams, and illustrations are included in many of the articles. L.C.

RUDEN, TOLLEF. The forests in Northwestern America. Norsk Skogind. 6, no. 11: 347-72 (November, 1952). [In Norwegian; English summary]

This is an extensive report of an ECA-fellowship trip of the author for studying the forests and forestry in British Columbia, Alberta, and Alaska, the climatic conditions, and the forest trees growing in the regions of this area. 1 table and 64 illustrations. E.S.

FUEL

THE BABCOX & WILCOX COMPANY. B & W develops oil additive to relieve boiler slagging. Paper Mill News 75, no. 49: 62 (Dec. 6, 1952).

The use of finely divided alumina or dolomite as an additive to low-grade fuel oils (Bunker C) for keeping steam-generating equipment operably clean from troublesome deposits on boiler tubes is outlined. The procedure and equipment developed for the first commercial-size unit under actual operating conditions at the Inglis station of the Florida Power Corp. is described. E.S.

CARTER, C. H. Automatic firing of hog fuel. Paper Mill News 75, no. 49: 109 (Dec. 6, 1952).

The author describes the development of an automatic system for firing hog fuel at the Bellingham plant of the Puget Sound Pulp & Timber Co.; it can fire automatically either hog fuel or oil, hog fuel as a major fuel and oil as an auxiliary, or vice versa. Since the installation of this system and after the necessary adjustments were made, boiler efficiency increased from 7.2 to 8%, when hog fuel is burned alone; proportionate increases are obtained when it is used as auxiliary fuel. E.S.

GRASSES

BHAT, R. V., and KARNIK, M. G. Indigenous raw materials for the production of pulp, paper and board. Part XI. Chemical pulps from *Andropogon contortus*, Linn. (kusal grass). Indian Forester 78, no. 7: 331-8 (1952); *cf.* abstract below.

Laboratory experiments on the preparation of chemical pulps by the soda and sulfate processes from kusal or spear grass (I) (a perennial growing abundantly in dry areas) are described. The proximate analysis of (I) gave 52.10% of Cross and Bevan cellulose, 16.92% of hemicelluloses, and 7.5% of ash; the average fiber length of the pulp was 1.1 mm. Both processes gave pulps of satisfactory strength properties; the sulfate process is preferable as it results in higher yields, better strength properties, and lower bleach consumption. Larger quantities of chemicals are required than in the pulping of sabai grass; the economical utilization of (I) will therefore depend upon its price at the mill site. Since the pulps are short-fibered, they should be used as admixture with long-fibered pulps, such as those from sabai grass or bamboo. 3 tables and 2 references. E.S.

BHAT, R. V., and SINGH, MAN MOHAN. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part X. Writing and printing papers from panni grass (*Vetiveria zizanioides*). Indian Forester 78, no. 6: 292-8 (1952); Indian Pulp and Paper 7, no. 7: 358-62 (January, 1953); *cf.* B.I.P.C. 23: 251.

Laboratory experiments on the pulping of panni grass (I) (a perennial species which is usually burned) by the soda process are described. A proximate analysis is included which shows a low cellulose content (45.83%) and a high percentage of hemicelluloses (25.45%), as compared with sabai or ulla grass; the average fiber length amounted to 1.2 mm. By using suitable cooking and bleaching conditions, a pulp suitable for writing and printing papers could be obtained. Bleach consumption, however, is high and, since (I) is not available in sufficiently large quantities in any concentrated areas to supply an economical papermaking unit, the short fibered (I) pulp should be mixed with long-fibered pulp from sabai grass. A sample sheet of writing paper prepared from 60% (I) pulp and 40% sabai-grass pulp is included. The economic utilization of (I) will depend upon its availability in pure form free from other grasses, such as dab grass. 3 tables, 1 sample sheet, and 2 references. E.S.

GUAR

HAUG, ARTHUR J. Guar mannogalactan studies. I. Purification and characterization of purified fraction. Tappi 36, no. 1: 47-53 (January, 1953).

A purified fraction of the mannogalactans from commercial guar mucilage was prepared by a specially developed hot water extraction and centrifuging technique. This fraction amounted to 76% of the original mucilage. The purified material was extensively characterized by means of physical and chemical analyses which should serve to aid future investigators in this field. Summative analyses accounted for 98.5% of the purified mucilage. 10 tables and 23 references. E.S.

HAUG, ARTHUR J. Guar mannogalactan studies. II. Effect of certain variables, including borax, on the rate of oxidation of the purified mucilage. Tappi 36, no. 1: 53-8 (January, 1953).

To produce a product from guar mucilage which is suitable as tub sizing, it is necessary to degrade the polymer. One method of doing this is by hypochlorite oxidation in the presence of borax. This reaction has been studied in the presence of *tert*-butyl alcohol or Celite as a dispersion agent. Borax decreases the rate of oxidation. The partially hydrolyzed guar mucilage does not form an insoluble complex with borax in the concentration range of 6 to 8%, 4 tables, 6 figures, and 6 references. E.S.

HAUG, ARTHUR J. Guar mannogalactan studies. III. Characterization of the oxidized and hydrolyzed mucilage. Tappi 36, no. 1: 59-62 (January, 1953).

The oxidation of guar mannogalactan by alkaline sodium hypochlorite produces a product which has a molecular weight lower than the original as evidenced by a decrease in solution viscosity and an increase in reducing power. A part of the sugar residues was oxidized to uronic anhydride. The component sugars which could be determined by analysis were reduced in amount. The content of mannose was reduced to a greater extent than that of the galactose by the oxidation. In the presence of borax, the rate of oxidation is decreased to approximately one half of that with borax absent. Part of this decrease is a result of the presence of the mucilage in an insoluble borax-mucilage gel as discrete particles so that the reaction is heterogeneous and topochemical in nature. 5 tables. E.S.

HAUG, ARTHUR J. Guar mannogalactan studies. IV. Conversion of purified mucilage for tub-size adhesive. Tappi 36, no. 1: 62-4 (January, 1953).

Conversions of the purified guar mucilage by oxidation in the presence of borax with sodium hydroxide at pH 11 produce adhesives which are useful as tub-sizing materials. Only a small amount of oxidant (approximately 5%) is necessary to degrade the guar polymer to produce a product of suitable viscosity. The folding endurance and bursting strength of a rag sheet were increased up to 187 and 46%, respectively. 5 tables and 2 figures. E.S.

HEATING (INFRARED)

METROPOLITAN-VICKERS ELECTRICAL COMPANY, LTD., *Manchester, England.* Infra-red projectors for moisture extraction. World's Paper Trade Rev. 138, no. 25: 1939 (Dec. 18, 1952); Paper Box Bag Maker: 242 (December, 1952).

The use of 10 Metrovick electric infrared projectors on a laminating machine for the manufacture of three-ply paper and board of varying thicknesses is described. 1 illustration. E.S.

HISTORY

MAIDWELL, C. F. A short history of paper making in North East England. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 29, no. 6: 170-8 (December, 1952).

A brief history of papermaking from the year 1639 in the area of Northumberland, Yorkshire, and Durham counties is sketched. A list of now defunct papermills is appended. 1 table, 1 map, and 4 illustrations. L.C.

HUMIDITY

WYLIE, R. G., and HARPER, A. F. A. The accurate control of relative humidity. Australian J. Appl. Sci. 3, no. 3: 219-27 (September, 1952).

A method and apparatus for the control of the relative humidity in a closed cabinet with an accuracy of $\pm 1\%$ R.H. are described. The relative humidity can be controlled independently of the cabinet temperature or made to depend on the cabinet temperature in a predetermined manner. The construction of the cabinet and the electrical circuit of the control unit, as well as the performance of the apparatus at high and moderate humidities are discussed. 7 figures. E.S.

ILLUMINATION

DODGSON, W. H. Lighting a papermill. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 29, no. 6: 161-7 (December, 1952).

The faults characteristic of an unplanned industrial lighting installation are: the prevalence of direct glare, a disregard for correct mounting height, the wrong type of fitting, and insufficient illumination. These characteristics are taken into account in a description of a complete lighting installation in a paper mill, and the problems of lighting the stock shed, the soda-recovery, bleachmaking, and sizemaking plants, the beater house, the finishing room, and the color-matching laboratory are considered. Special attention is directed to the area of the paper machines, the calenders, and the cutters and slitters. The merits of tungsten-filament and tubular fluorescent lamps are compared. 7 illustrations. L.C.

WHEELER, LEONARD ARTHUR. Color analysis in terms of lighting. Packaging Parade 21, no. 240: 118-19 (January, 1953).

The "cool" white lighting recently adopted by supermarkets and other retail outlets distorts package colors, depriving them of sales appeal. A spectrophotometric examination of the color in question will reveal the spectral area in which the color fails to meet the requirements of the lighting curve. The process for solving color-distortion problems is described, and a case history of the change in the red of the Carnation Company's label is given to illustrate these methods. 1 table and 3 figures. L.C.

INSTRUMENTATION

WALTER, LEO. Automatic controls in paper making. Can. Pulp Paper Ind. 6, no. 1: 8-10, 14 (January, 1953).

The author discusses different instruments for stock-flow metering in papermaking constructed by The Bristol's Instrument Co. Ltd., England, including a blowtank consistency regulator and various systems for the automatic control of flow and blending of pulp stocks. 5 figures. E.S.

INTERIOR PACKING

BOHLMANN, MURRAY. Fibrous shipping pack made up of 2 parts molded to shape of contents. Packaging Parade 21, no. 240: 102-3 (January, 1953).

Keiding Paper Products Company, Milwaukee has developed a three-piece package for the shipping of irregularly shaped, fragile items. Two blocks of a lightweight fibrous material molded to the shape of the contents suspend the item in the weight center of the corrugated container. 2 illustrations. L.C.

KORNREICH KLEINS BAKERY, *Milwaukee.* Compartmented cookies. Modern Packaging 26, no. 5: 94-5, 182 (January, 1953).

This bakery has developed a method of packaging which protects cookies against breakage and staleness. The cookies are filled flat into strips of heat-sealing cellophane, and a dividing heatseal is made between each cookie. The filled, compartmented cellophane strips are then fitted into a slotted chipboard rack and finally placed in a setup box. Thus the cookies are suspended clear of the box bottom. The packaging methods and their advantages are discussed. 5 illustrations. L.C.

RICHARD E. PAIGE, INC., *New York.* New corrugated design principle. Fibre Containers 37, no. 12: 64, 66, 71-2 (December, 1952).

The company has developed a new basic principle of folding corrugated board which allows the board to be scored and folded in irregular shapes for use as inner packing to "suspend" delicate items within a square carton. The method is called "compensated scoring" and is based on the fact that, in order to fold irregular score lines, there must be other related lines of identical contour but in reversed or mirror-image form at a spaced distance away, so that the irregularities of one score will compensate for the irregularities of the other. The material between the score lines takes on the contour between these lines and panels result which are somewhat reminiscent of the facets of cut stones. Several of these compensated wrappers are shown, and other Paige developments, such as circumflexion with its applications and corrugated floor display stands, are described. 10 illustrations. L.C.

IONS

KUNIN, ROBERT, and MCGARVEY, F. X. Ion exchange. Ind. Eng. Chem. 45, no. 1: 83-8 (January, 1953); *cf.* B.I.P.C. 22: 406.

The industrial applications of ion exchange continued to increase in 1952. The literature in this field is reviewed, including several references to ion-exchange membranes, deionization, recovery, purification, preparation and analysis, waste treatment, and ion-exchange resin syntheses. 413 references. L.C.

JUTE

BELL, W. A. The retention of organic liquids by jute. J. Textile Inst. 43, no. 12: T595-7 (December, 1952).

After extraction with various organic liquids, samples of raw jute tenaciously retain a certain amount of the liquid even after 48 hours at 110°C. The quantities retained ran from a negligibly small amount for petrolic ether to around 4% in some samples with diethyl ether. Soaking the samples in water releases the bound organic liquid. The retentions for jute are higher than for cotton. The author's retention values for airdry cotton are lower than the results of Staudinger and Döhle (*cf.* B.I.P.C. 13: 466-7) using water-swollen fibers. 1 table, 1 figure, and 5 references. K.W.,Jr.

LIGNIN

FREUDENBERG, KARL, and HÜBNER, HANS HUGO. Hydroxycinnamyl alcohols and their dehydrogenation polymerizates. Chem. Ber. 85, no. 12: 1181-91 (Dec. 30, 1952). [In German] *cf.* B.I.P.C. 22: 498.

New improved methods for the preparation of syringyl, sinapinyl (I), and coniferyl (II) alcohols, and gallic aldehyde are described. (II) has been subjected to the action of dehydrogenase (isolated from fresh mushrooms) in an atmosphere of oxygen for eight hours at a pH 5 and 20°C., giving dehydrodiconiferyl alcohol (III) as a crystalline compound. Upon longer exposure an amorphous product is formed with properties similar to those of spruce lignin. Under similar conditions, (I) gives no satisfactory result. An equimolecular mixture of (I) and (II), on the other hand, gives a mixed polymerizate in good yield with a methoxyl content of 23.9% and an ultraviolet absorption curve very similar to that of a beech lignin. In place of the mushroom enzyme, the reduction-oxidation system of a woody tissue just in the process of lignification may be used for the synthesis of (III).

These results support the concept that (III) is an important building element in the formation of lignin. 2 tables, 1 diagram, and 28 references. F.E.B.

LEOPOLD, BENGT. Studies on lignin. XV. Nitrobenzene oxidation of lignin-resorcinol condensation products, methylated with diazomethane. Acta Chem. Scand. 6, no. 8: 1294-7 (1952). [In English] *cf.* B.I.P.C. 23: 332.

In continuing his work on the oxidation of lignin and lignin-model condensation products with resorcinol, the author has extended his experiments to include more stable phenol nuclei (2-naphthol) and lignin-resorcinol condensation products methylated with diazomethane. The condensation product of vanillyl alcohol with 2-naphthol [1-(4-hydroxy-3-methoxybenzyl)-2-naphthol] upon nitrobenzene oxidation gave 36% theoretical yield of vanillin, and the product obtained by heating sprucewood with 2-naphthol at pH 0.5 gave 38% of the "normal" yield of vanillin. Oxidation of vanillyl alcohol condensation products with some methylated phenols gave little or no vanillin. Oxidation of lignin-resorcinol condensation products methylated with diazomethane gave decreases in the yield of vanillin up to 30%. The author assumes that most of the decrease in the yield of vanillin resulting on methylation of the condensation products is caused by stabilization of resorcinol nuclei attached to vanillin-yielding elements, and not simply by methylation of phenolic hydroxyl groups in such elements. In an argument based on the discussion of Part VI (*cf.* B.I.P.C. 22: 747-8) the author concludes that all the vanillin-yielding elements in lignin contain at the alpha-position groups reactive towards resorcinol (and other phenols) in acid solution, and most of these groups seem to be of the B type (*cf.* Erdtman, B.I.P.C. 11: 141-2). 2 tables and 9 references. I.A.P.

LOADING AND UNLOADING—CARS

FOOD ENGINEERING. Compartmentized car. Food Eng. 25, no. 1: 77 (January, 1953).

A new system of car loading developed by the Pullman-Standard Car Mfg. Co., known as "compartmentizing," is described. Gates borne on trolley rails provide three adjustable compartments, so that mixed loadings can be segregated. Accelerated loadings and reduced damages during transit are claimed for the new method. 4 illustrations. E.S.

MACHINERY

ANON. Suppliers to the paper trade. Paper-Maker (London) 124, Annual no.: 48, 50, 52, 54, 58-60, 62, 65-6, 68-70, 72-4, 76-81 (1952); *cf.* B.I.P.C. 22: 410.

The progress and new developments in machinery and materials during the past year are reviewed by a number of British firms which supply the papermaking trade. Numerous illustrations. E.S.

GREAT BRITAIN. BOARD OF TRADE. *Commercial Relations and Exports Department. Special Register Information Service.* Pulp and paper machinery; scope and conditions of Canadian market. World's Paper Trade Rev. 138, no. 16: 1207-8, 1210, 1212, 1214, 1219-20 (Oct. 16, 1952).

The conditions of the Canadian pulp- and paper-machinery market and

the opportunities for United Kingdom manufacturers to share in this market are discussed. 2 tables. E.S.

MACHINERY—BEATERS

ANON. Paper pulping made easy. Indian Print & Paper 18, no. 2: 14 (October, 1952).

Reference is made to the cover applicable to any standard beater patented by Robert McNeill which is claimed to enable paper pulp to be processed in a fraction of time required by present-day methods. The backfall is kept closed and the stuff is impinged progressively against a series of baffle plates. The beating takes place in intermittent cycles which are governed by a solenoid-controlled valve. It is claimed that from 65-70% of the power normally used can be saved. E.S.

MACHINERY—BLOW-PITS

BOWLE-EVANS, P. N. Self-sluicing blowpits at Gatineau. Pulp Paper Mag. Can. 53, no. 13: 88-91 (December, 1952).

Attempts to change the batch blowpit system of the sulfite digesters at Gatineau to a continuous operation are described. The first experiments with submerged stationary and swinging nozzles gave no satisfactory results. A required increase in sulfite capacity was finally met by the construction of two additional digesters and three brick-lined, reinforced-concrete blowtanks somewhat on the line of kraft blowtanks, each equipped with a two-blade, motor-driven agitator, a pump which discharges into one of two stock lines (newsprint of bleached grade), and a liquor dilution system. The special problems presented by the construction of these 80,000-gal. blowtanks in a limited space are outlined; details of the operation, almost automatic control, and advantages of the self-sluicing blowpits are given. 4 figures. E.S.

MACHINERY—CALENDERS

ANON. Protection of calender rolls. World's Paper Trade Rev. 138, no. 24: 1830, 1833 (Dec. 11, 1952).

Chromium-treated calender rolls can be used with metal doctor blades; however, the very expensive facilities for treating large calender rolls with chromium do not exist in Great Britain where the demand for this service is much smaller than in the United States. The deposition of nickel in place of chromium on chilled or unchilled cast iron rolls is another alternative for protection against corrosion and one which can be carried out in British factories. However, nickel surfaces cannot be doctored by a metal blade. Vickerys Ltd. has evolved a special-composition blade for this purpose which has been in use for a number of years and has given satisfactory service. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. Edge positioning device aligns web in laminating operation. Boxboard Containers 71, no. 721: 30-1 (January, 1953).

A device for controlling laminating-web alignment produced by the Askania Regulator Co., Chicago is described. The unit consists essentially of a set of air nozzles, controllers, and cylinders, and involves an air-sensing, hydraulic-power arrangement. Details of its construction and automatic operating cycle are given which result in the correct alignment of the laminated web to 1/32 of an inch, with particular reference to its installation on the Andre-matic laminator of Morris Paper Mills, Morris, Ill. and the resulting advantages. 3 illustrations. L.C.

KOTTE [HANS] The "Hermetet" package. Verpackungs Rundschau no. 12: 468-9 (December, 1952). [In German] *cf.* B.I.P.C. 22: 751.

A similar description of the lined folding box, a Swedish invention, and the recently developed filling and packing machine is given as in the previous reference. 5 figures. E.S.

MACHINERY—CORRUGATING MACHINE

MAX, K. W. An operator designs a corrugator. Tappi 36, no. 1: 56A, 58A, 60A, 62A (January, 1953); Fibre Containers 38, no. 1: 45-6, 48 (January, 1953).

With reference to the more rigid specifications, narrower control limits, and demands for higher production facing the industry, the author attempts to point out several weaknesses in the present-day corrugator design and its operation. Suggestions to an approach for an improved design of the single facer, the bridge structure, and the double backer are made. Nip-loading tests which illustrate the relationship of rigidity and corrugator-roll nip pressure for bogus, semichemical, and kraft corrugating media and their results are discussed briefly to emphasize the need for instrumentation on corrugating machinery. 4 figures. E.S.

SCORDAS, H. T. Résumé of answers to combiner questionnaire. Tappi 36, no. 1: 38A, 40A, 42A, 44A (January, 1953); Fibre Containers 38, no. 1: 26, 28, 30 (January, 1953).

In developing a basis for further studies, the TAPPI Corrugated Container Committee and its several sub-committees made a survey of present practices in the corrugating industry. Sixty-one corrugators, from single-faces of the 1920's to every recent make, were covered by the questionnaire. Data were gathered on the speed and roll size of each machine, roll wear and maintenance, high and low corrugations, fingerlines, adhesives, and heat and moisture control. These compiled facts are summarized and interpreted. L.C.

MACHINERY—CUTTERS

CHAMPLAIN COMPANY, *Bloomfield, N.J.* High-speed sheeter delivers to pile in unending stream. Boxboard Containers 71, no. 721: 42 (January, 1953); Am. Paper Converter 27, no. 2: 26 (February, 1953).

A new high-speed, continuous-delivery sheeter is described. It cuts up to 11,000 sheets per hour of glassine and paper-backed foil, up to 12,500 sheets per hour of label paper, and 14,800 sheets per hour of heavy paper and paperboard. Consistently squared sheets from roll stock are cut to 1/64-inch accuracy. 1 illustration. L.C.

MACHINERY—DRIVE

GAHL, E. A. Analysis of variable speed requirements. Paper Ind. 34, no. 10: 1235 (January, 1953).

The advantages of variable speed drives in paper-mill applications are outlined by several examples; the need for an advance analysis of problems is stressed to secure the most economical drive for a specific job. 1 table and 2 illustrations. E.S.

MACHINERY—DRYERS

TITTEMORE, C. R. Application of the Oliver vacuum cylinder to sulphite pulp drying. Pulp Paper Mag. Can. 53, no. 13: 98-100 (December, 1952); *cf.* B.I.P.C. 21: 264.

The installation of an Oliver ring-valve vacuum cylinder on the wet end of the pulp machine at the Gaspesia Sulphite Co. is described; it is one of the first applications of this type of cylinder for the purpose of forming a sheet of pulp for subsequent pressing and drying. The cylinder is installed ahead of the two Kamyr presses and replaces the felt section of the old four-cylinder machine. In addition to increased production of dry pulp, a heavier sheet can be formed with this arrangement, so that the Kamyr presses can be operated at higher nip pressures and at increased efficiency. Details of the cylinder construction and operation of the system are given. 4 tables and 1 reference. E.S.

MACHINERY—ECONOMIZERS

ANON. Mando completes installation of Briner economizers. Paper Ind. 34, no. 7: 829-30 (October, 1952).

The installation of 10 stainless-steel Briner economizers on the three paper machines in the mill of the Minnesota and Ontario Paper Co. at International Falls, the operation of the equipment with thermostat control, and its advantages are described. The new installation replaces heating and ventilating equipment which was placed in operation in 1936; steam savings, better drying, and improved working conditions have resulted. E.S.

MACHINERY—ELECTRIC EQUIPMENT

ANON. The electrical system at Elk Falls. Paper Mill News 75, no. 49: 100 (Dec. 6, 1952); *cf.* B.I.P.C. 23: 114.

This is the identical article previously published under the name of Alexander, F. E.S.

MACHINERY—FELTS

FRENCH, DAVID W. Performance of paper machine wet felts. II. Further studies of the plugging of felts. Tappi 36, no. 1: 20-35 (January, 1953); *cf.* B.I.P.C. 20: 793.

The wet felts of papermaking machines may become plugged or occluded by deposits which accumulate on and adhere to the wool fibers. This often occurs before mechanical wear or microbiological deterioration have much affected felt performance, although plugging may be associated with some aspects of microbiological activity within the felts. To determine the degree to which various felts were plugged, the following techniques were used: (1) samples of felt were embedded in plastic, sectioned with a microtome, and the sections stained and examined microscopically; (2) the amount of time required for a given amount of water to pass through a sample of felt under standardized conditions was determined; (3) the amount of water absorbed by a felt sample of standard size, and the amount retained after passing the wet sample through a wringer under constant pressure were measured. A combination of these methods gives more accurate information than any one of them alone. A number of techniques were devised to determine the nature and composition of the material which caused plugging: (*a*) plugged felts were extracted with various solvents to obtain resins and similar materials; (*b*) felt samples were ashed to determine mineral content; and (*c*) samples were blendorized in a Waring blendor to remove

deposits from the fibers. These were subsequently separated, and the deposits subjected to various tests to determine their nature. As a result of these tests it was found that the material causing the plugging might consist principally of resins, principally of filler material, or principally of fragments of scales from the outside of the wool fibers. In many felts, the plugging material was a composite of different substances, with considerable variation in make-up from mill to mill, according to the type of pulp processed and the kind of paper produced. Various attempts were made to determine the role played by bacteria in the plugging of felts. These involved culturing of plugged material to determine the number and kinds of bacteria in it, partition chromatography of new and used felts in an attempt to detect bacterial by-products as well as degradation products of the felts, and the inoculation of felt samples with bacteria. It seems unlikely that aggregations of bacteria are solely responsible for large amounts of plugging, but the presence of bacteria may increase the amount of plugging caused by other materials. 11 tables, 31 figures, and 7 references. E.S.

MACHINERY—KNIVES

GILL, PAUL. Guillotine knives. Brit. Printer 65, no. 388: 42-4 (January-February, 1953).

The various steps in the manufacture of guillotine knives are described. It has been found that a bimetal knife consisting of a steel face fused to an iron backing is the most efficient and economical; however, the production of knives from a steel of higher alloy is being investigated. Knife troubles such as bowing and chipping are discussed, and remedies for these conditions are suggested. Hints are given to aid in the ordering of the best knives for a particular job and machine. 4 illustrations. L.C.

MACHINERY—MIXING APPARATUS

RUSHTON, J. HENRY. Mixing. Ind. Eng. Chem. 45, no. 1: 93-5 (January, 1953); *cf.* B.I.P.C. 22: 412.

References are made to the 1952 mixing publications which dealt with power characteristics, heat transfer, continuous flow and mixing, continuous flow contacting, the mixing of viscous liquids, and gas-liquid contacting. 1 illustration and 17 references. L.C.

MACHINERY—PACKAGING MACHINERY

ATTENDU, A. C. The S-H automatic roll wrapping machine. Pulp Paper Mag. Can. 53, no. 13: 109 (December, 1952); *cf.* B.I.P.C. 21: 852.

The construction and operation of the machine for wrapping newsprint rolls and certain modifications of the original design are described. 2 illustrations. E.S.

MACHINERY—PAPER MACHINE

MILLER, ROBERT A. How to calculate the cost of down time on paper machines. Paper Mill News 76, no. 1: 10-12, 14-16 (Jan. 3, 1953).

The author describes the system developed by the Kalamazoo Vegetable Parchment Co. for calculating the machine-hour rate of their six machines and the cost of down time for these machines, as well as the resulting advantages of greater cost consciousness throughout the organization and speedy correction of unsatisfactory situations. Examples are included. 9 tables. E.S.

MACHINERY—PAPER MACHINE—YANKEE TYPE

ANON. Hoberg's pride is new No. 1 machine. Pulp & Paper 27, no. 1: 36-8, 40, 42, 44 (January, 1953); Paper Trade J. 135, no. 25: 12 (Dec. 19, 1952); Paper Mill News 75, no. 51: 9-10 (Dec. 20, 1952); Paper Ind. 34, no. 10: 1204-5 (January, 1953).

The first reference gives a detailed description of the new 178-inch Beloit Yankee Fourdrinier machine for dry-creped tissues with Reliance sectional drive and auxiliaries; it is equipped with a Beloit air-cushioned headbox and a "Sunday" drive which keeps the Yankee drier revolving just sufficiently during shutdown periods to avoid water accumulations. 20 illustrations. The other references give much shorter descriptions with 1 illustration each. E.S.

MACHINERY—PIPING

BRACA, R. M., and HAPPEL, J. New cost data bring economic pipe sizing up to date. Chem. Eng. 60, no. 1: 180-7 (January, 1953).

Two procedures for selecting economic pipe sizes are outlined; calculations and examples are included. 6 tables and 16 diagrams. E.S.

MACHINERY—PULPERS

POLLEYS, RICHARD W. Modern board mill stock preparation systems. Pulp Paper Mag. Can. 53, no. 13: 101-5 (December, 1952).

Supplemented by a flowsheet for a three-stock mill (top liner, bottom liner, and filler), a modern continuous stock-preparation system with Downingtown Fibrepulpers and Fibrecleaners is described. Many modifications of this system can be made to suit individual mill conditions. 1 flowsheet and 5 diagrams. E.S.

MACHINERY—ROLLS

ANON. Maximum compound leverage. World's Paper Trade Rev. 138, no. 20: 1548, 1550 (Nov. 13, 1952).

In answer to an inquiry concerning the maximum compound leverage obtainable on press or baby-press rolls with horizontal levers or levers at an acute angle, three diagrams with necessary explanations are presented which indicate that the horizontal position is the correct one. 3 diagrams. E.S.

MACHINERY—SLITTERS AND WINDERS

HOAR, J. E. Pneumatic control and the reeling of paper. World's Paper Trade Rev. 138, no. 20: 1504 (Nov. 13, 1952).

Reference is made to a new design of winder with pneumatic control of all operations during reeling and transfer to a new reel shell. The pressure applied to the paper during winding can be adjusted as required and kept constant. A British patent application has been filed. 2 figures. E.S.

MACHINERY—VALVES

NEWMAN, HENDER & CO., LTD., *Woodchester, England.* Unique steam valve. World's Paper Trade Rev. 138, no. 25: 1954, 1956 (Dec. 18, 1952).

A new type of steam valve which discards the use of the recognized valve and valve seat and employs a stainless-steel ball instead is described. The valve can be repacked while still under full steam pressure. 1 figure.
E.S.

ROCKWELL, R. A. Valve sizing accuracy. Paper Ind. 34, no. 10: 1242-3 (January, 1953).

Directions for the determination of a control-valve size for a given application based on the use of the valve-flow coefficient C_v and reasonable assumptions are given. 6 figures. E.S.

MATERIALS HANDLING

ANON. Roll stacking cuts storage space. Paper Mill News 76, no. 3: 70 (Jan. 17, 1953).

The Bemis Bro. Bag Co. at its Mobile, Ala. plant handles mostly paper rolls, 40 inches in diameter and from 20 to 60 inches in width. Automatic Skylift electrical industrial trucks with rotating clamping attachments are used for handling and stacking the rolls on end and for transporting them from storage to the converting department where multiwall bags are manufactured. The total handling runs spasmodically from between 50 to 200 tons a day. 3 illustrations. E.S.

DUNN, ALLISTAIR. Management approach to material handling engineering. Paper Mill News 76, no. 3: 77-8 (Jan. 17, 1953).

The author emphasizes the fact that efficient material handling must be planned and that materials-handling engineering is an essential part of the manufacturing operations with equal status of other engineering departments. The organization, functions, and some of the achievements of the department at the Buffalo Assembly Plant of the Ford Motor Co. are outlined.
E.S.

G. D. PETERS and COMPANY, LTD., *Slough, England.* Automatic doors in paper mills. World's Paper Trade Rev. 138, no. 21: 1618, 1620, 1622 (Nov. 20, 1952).

The time-saving features of automatic doors for either manual or electrical operation are explained, with particular reference to their advantages in connection with mechanized handling equipment. Examples of installations of power-operated swing doors, folding doors, and sliding doors are given. 2 illustrations. E.S.

SPEAKER, RICHARD L. Materials handling. Ind. Eng. Chem. 45, no. 1: 88-92 (January, 1953).

A review of the 1952 literature on materials handling is presented. The aids in handling which are dealt with include: bulk handling belt conveyors, devices for bulk handling in bins, package conveyors, monorails and hoists, fork trucks, pneumatic tubes, and pallets and unit loads. 6 illustrations and 55 references. L.C.

TAYLOR MACHINE WORKS, *Louisville, Miss.* New "yardster" is used in Alabama. Pulp & Paper 27, no. 1: 88 (January, 1953); Paper Mill News 76, no. 3: 72 (Jan. 17, 1953).

A brief description of a yardster for the rapid handling of pulpwood from truck to railroad rack cars is described. The mechanical device is mounted on a standard truck, and the handling apparatus functions as a lift truck but in reverse. 2 illustrations. E.S.

WEBB, JERVIS C. Improved materials handling will bring greater safety to industry. Paper Mill News 76, no. 3: 60, 64, 66 (Jan. 17, 1953).

The author describes the advantages of mechanized materials handling (particularly in the conveyor field) in the transportation, processing, storing, and assembling of goods. Reference is made to available safety codes, and safety principles and features of conveyors are discussed. E.S.

WEBER, R. F. A materials handling program. Paper Mill News 76, no. 3: 38, 40, 42, 111 (Jan. 17, 1953).

The author discusses the methods, equipment, process flow, and costs which should receive consideration in the planning and organizing of a materials-handling program; occasional reference to the materials-handling research laboratory of the International Harvester Co., Chicago is made. E.S.

WETTSTEIN, FRANK E., BATTLE, J. B., and BAILERY, LLOYD, JR. Safety and materials handling. Paper Mill News 76, no. 3: 86, 88, 92 (Jan. 17, 1953).

At a safety meeting at Houston, Texas, the following three papers on safety in materials handling were presented: the first of the three authors discussed "A safety engineer's analysis of materials handling accidents"; the second, "New safety records with improved materials handling"; and the third, "Incentives for safety." E.S.

WHITAKER, E. G. Whither the pallet? J. Inst. Packaging 2, no. 17: 178-81 (Autumn, 1952); Brit. Packer 14, no. 12: 36-7, 39 (December, 1952).

The author reviews the advances in pallet handling and indicates the effects of this type of handling upon rail and trucking equipment and methods, factory design and warehouse layout, packaging design, materials-handling equipment, and "throughout"-load handling. 1 illustration. L.C.

MERCERIZATION PROCESS

LEGRAND, C., and GRUND, A. Formation of alkali cellulose in aqueous alcohol. J. Polymer Sci. 9, no. 6: 527-30 (December, 1952). [In French; English and German summaries]

The formation of sodium compounds of cellulose by sodium hydroxide proceeds much more easily in aqueous alcohol than in either solvent alone. Sodium cellulose II, for instance, is formed with 2 *N* alkali in aqueous alcohol (around 75% alcohol), whereas it is not formed in either aqueous or alcoholic sodium hydroxide at this concentration; 8% aqueous sodium hydroxide is required for the formation of this compound. The nature of the alcohol influences the effect: isopropyl is more active than propyl which, in turn, is more active than ethyl, whereas tertiary butyl is inactive. The authors point out the theoretical importance of their results and their application in forming alkali cellulose and in mercerization using lower alkali concentrations. 2 figures. K.W.,Jr.

MILL CONSTRUCTION

TAYLOR, K. G. Job organization and construction coordination. Tappi 36, no. 1: 115-18A (January, 1953).

The author discusses the job organization from the point of contracts and various setups to their extension to the construction of pulp and paper mills

(either expansion of old mills or completely new units) until they are ready for the start-up. Job organization in this case involves three interested parties: owners, engineers, and the contractor; three different types of contracts (cost-plus-fixed fee contract, price-unit contract, and lump-sum contract), the sequence of job organization under each, and their economical features are covered in detail. Construction co-ordination does not reach the degree of importance in the earlier stages of construction as in the latter part of the job when start-up schedules are anticipated. Suggestions for the most efficient solution of the problem during construction work and the transition from the contractor's crews to the mill's operating personnel are given. E.S.

MILL MANAGEMENT

BUTLER, JOHN J. Job evaluation—what it is, how implemented, and how used. Part I. Paper Ind. 34, no. 10: 1228 (January, 1953).

The advantages of a job evaluation program, the policies to be considered before its start, the basic steps to be taken, and the maintenance of the plan are outlined briefly. E.S.

RUTT, A. HUGH. Mill maintenance by a mill manager. World's Paper Trade Rev. 139, no. 1: 36, 38, 40 (Jan. 1, 1953); Paper-Maker (London) 124, no. 6: 503-4, 506 (December, 1952).

The author emphasizes the importance of mill maintenance by discussing the hidden losses caused by the inefficient operation of stuff pumps, drum strainers, beaters, and electrical equipment (motors and starters). Efficient paper-mill maintenance calls for the co-operation of the entire mill staff, particularly with regard to the proper usage of equipment and prompt reporting of any signs of wear or fault. It also requires a system of routine inspection and records of work done to the individual items and involves adequate tools, machinery repair shops, and the availability of spares. E.S.

MUCILAGE

TADROS, WADIE, and KAMEL, MOHAMED. A preliminary study of the main polysaccharide of the *Lupinus termis* seeds. J. Chem. Soc.: 4532-3 (November, 1952).

Lupinus termis seeds (500 grams) extracted with 0.5, 1, or 4% sodium hydroxide, yield 10-15 grams of polysaccharide. Hydrolysis with 4% sulfuric acid gives 13.8% L-arabinose and 79.4% of D-galactose, together with a D- or L-galacturonic acid (oxidized to mucic acid). J.C.W.

PACKAGING

ANON. Cranberry packagers swing to window boxes. Boxboard Containers 71, no. 721: 41 (January, 1953).

For reasons of protection, stacking convenience, and sales appeal, the trend in cranberry packaging has moved from bulk handling toward unit packaging in folding boxes which have heavy, nonfogging, transparent acetate windows. American Cranberry Exchange statistics on packaging for 1948 to 1952 are given which show that bulk packaging decreased from 45.2 to 2% during this period. 1 table and 1 illustration. L.C.

ANON. Mountain moves to Mohammed in this packaging operation. Packaging Parade 21, no. 240: 121-2 (January, 1953); *cf.* B.I.P.C. 23: 31.

A description is given of the methods employed by fruit and vegetable growers to prepackage produce in the field. Commercial vacuum cooling methods are combined with the operations of a new mobile, self-powered carton stitching machine. 3 illustrations. L.C.

ANON. Narrow line heat-sealing. Brit. Packer 14, no. 10: 27-8 (October, 1952).

Most machines for overwrapping cartons with cellophane were originally designed to handle waxed paper. Although this does not affect the basic handling and wrapping when moistureproof cellulose film is employed, it influences the heat-sealing techniques. Directions are given for reducing the area of the film coming in contact with the heating surfaces, so that narrow-line sealing results which does not impair the film and improves the efficiency of the protective wrapper. The advantages of the procedure are outlined. 2 figures. E.S.

ARNER COMPANY, *Buffalo.* Blow out the empty! Modern Packaging 26, no. 5: 126 (January, 1953).

The company has eliminated manual inspection to detect unfilled cartons by using a simple air-jet which is composed of a standard air-compressor unit, a length of iron piping surmounted by a standard petcock, and an air pressure gage, and is mounted near the package conveyor. Light unfilled cartons are blown off the line into a bin, whereas the heavier, filled cartons pass by freely. The setup is adaptable to various carton weights. 1 illustration. L.C.

BENJAMIN ELECTRIC MANUFACTURING COMPANY, *Des Plaines, Ill.* Scaling efficiency peak with manual packaging techniques. Packaging Parade 21, no. 240: 54-5 (January, 1953).

The company has developed an efficient one-man station for manually packaging fluorescent lighting channels. A description is given of the station and its operation. 7 illustrations. L.C.

COWAN, A. F. Packaging—problem or opportunity? J. Inst. Packaging 2, no. 17: 182, 184, 186 (Autumn, 1952).

The author urges the manufacturer to regard packaging as an integral part in the process of producing his item, and to orient his protection and retailing ideas from this standpoint. L.C.

COWAN, JOHN M. The battle of the films. Tappi 36, no. 1: 118-21A; discussion: 121A (January, 1953).

The author reviews briefly the development, important properties, and packaging applications of cellophane, Pliofilm, saran (including Cry-O-Rap), polyethylene, cellulose acetate film, and Mylar polyester film. Although the flexible-packaging industry has a bright future, no film can be sure of unlimited exploitation of a certain market without competition sooner or later. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 41. Cartons and display outers. World's Paper Trade Rev. 138, no. 15: 1104, 1106, 1108 (Oct. 9, 1952); *cf.* B.I.P.C. 23: 194-5.

The increasing use of attractive cartons for packaging merchandise, the types of board and paper employed in their manufacture, and some novel British cartons are discussed. 3 illustrations. E.S.

GOLDEN STATE COMPANY, LTD. A product, a problem and a package. Packaging Parade 21, no. 240: 57 (January, 1953).

"Tekko," a nonfat dry milk product, is being sold in a three-ply envelope consisting of polyethylene laminated to aluminum foil, with the foil laminated to sulfite paper which is subsequently lacquered. The carton which contains the 3.5-ounce packages is also lacquered. 4 illustrations. L.C.

HAGENAH, HELMUTH. The ECO-package. Neue Verpackung 5, no. 12: 354-5 (December, 1952). [In German] *cf.* B.I.P.C. 21: 177.

An illustrated description of the dust- and vaporproof construction of the Eco carton is given. 6 illustrations. E.S.

HARRY & DAVID, INC., *Medford, Ore.* Fruit by mail. Modern Packaging 26, no. 5: 116-19, 185-6 (January, 1953).

Mail-order merchandising of fresh fruit requires outstandingly attractive, unusual, and protective packaging to meet the increased competition in this area. The packaging methods of this company are described and compared with those of its competitors. 8 illustrations. L.C.

MODERN PACKAGING. G-E light bulbs. Modern Packaging 26, no. 5: 96-102, 185 (January, 1953).

The development by the General Electric Co. of a corrugated sleeve package for light bulbs and of its famous identification monogram is traced. The company's present packaging processes are described and the protective and merchandising aspects of its packages are commended. 14 illustrations. L.C.

MODERN PACKAGING. Review and preview. Modern Packaging 26, no. 5: 83-9, 188, 190 (January, 1953); *cf.* B.I.P.C. 22: 418.

The 1952 packaging developments are reviewed; polyethylene bottles and tubes were the outstanding packaging developments of the year, but new uses for papers, molded pulp, metals, plastic films, and glass were found. These innovations are described, and the packaging materials outlook for 1953 is indicated. 26 illustrations. L.C.

RHODES, S. C. Packaging and palletising motor accessories. J. Inst. Packaging 2, no. 17: 166-8 (Autumn, 1952).

The contract- and pallet-packing methods of an English automobile accessories manufacturer are described. 5 illustrations. L.C.

YOCHIM, ALBERT. The inventive approach to package design. Am. Paper Converter 26, no. 12: 18 (December, 1952).

Consumer packages are called upon to perform a wide variety of duties; the converter must know these functions in order to serve his clients effectively. The ten principal points which must be considered in package design are listed. L.C.

PAPER—COATED

SHEERAN, S. R. Polyvinyl alcohol and polyvinyl acetate in the paper industry. World's Paper Trade Rev. 138, no. 18: 1382-4, 1388 (Oct. 30, 1952).

This is a reprint of a chapter of TAPPI Monograph no. 9 "Protein and synthetic adhesives for paper coating." 1 table. E.S.

STILBERT, E. K. Latexes for paper coating. World's Paper Trade Rev. 138, no. 18: 1369-70, 1372, 1374, 1379-81 (Oct. 30, 1952).

This is a reprint of a chapter of TAPPI Monograph no. 9 "Protein and synthetic adhesives for paper coating." 3 tables, 2 figures, and 2 references. E.S.

ZEILSTRA, FRED G. Paper and the process artist. Natl. Lithographer 60, no. 1: 27 (January, 1953).

Variations in the properties of paper stocks (such as absorbency or surface hardness of the paper and its reflectance or relative whiteness or color) greatly influence the appearance of the finished lithograph. The surface properties of Kromekote are discussed in particular; although this paper seems to have a high degree of surface hardness, it is actually quite porous. Regular offset inks are never used to best advantage on this type of paper; transparent inks with a high gloss are the most suitable for Kromekote. L.C.

PAPER—COATED (HOT-MELT)

ANON. Coating and laminating with polythene. Brit. Packer 15, no. 1: 68, 77 (January, 1953); Paper Market: 142 (November, 1952); Paper-Maker (London) 124, Annual no.: 47 (1952).

The Clyde Paper Co. Ltd. has installed the first machine in Great Britain for the extrusion-lamination process for manufacturing polyethylene-coated paper according to American methods. The process, the properties of polyethylene, the moisture-vapor permeability of the coated paper, and principal applications, particularly in the protective packaging field, are discussed briefly. Polyethylene-coated paper is effective under both arctic and tropical conditions. 2 tables. E.S.

PAPER—CONVERSION

ANON. Netherlands firms rebuild with packaging papers. Am. Paper Converter 26, no. 12: 16-17 (December, 1952).

Cats Paper Co., Ltd., and Neparofa, Ltd. of Rotterdam, Holland have combined their converting activity under one roof without losing their separate business identities. The plant layout and equipment are described, and the main packaging products are listed; 45% of the plant's output is exported. 3 illustrations. L.C.

MARTIN, JOHN W. Hoberg Paper Mills expand tissue production. Am. Paper Converter 27, no. 1: 14-16 (January, 1953); *cf.* B.I.P.C. 23: 417.

With reference to the installation of a new Beloit Yankee Fourdrinier machine at the Hoberg Paper Mills in Green Bay, Wis. and the company's expanded production of sanitary paper products (about 65% of which are sold under the Charmin label), the converting operations and some of the important machinery are described briefly. 4 illustrations. E.S.

ZEIGLER, D. W. Modern materials handling keys Bay West expansion. Paper Ind. 34, no. 10: 1236-9 (January, 1953).

The new converting plant of Bay West Paper Co., Green Bay, Wis. and its equipment are described; sulfate toweling stock from Mosinee Paper Mills Co.—of which Bay West is a division—is here converted to Mosinee

towels. The new plant is a single-story structure with streamlined materials-handling facilities. 11 illustrations. E.S.

PAPER—DEFECTS

BEDWARD, W. F. S., BRADLEY, L. V., and STEERS, W. J. Today's paper is pretty good but pressmen want something better. Brit. Printer 65, no. 388: 46-51 (January-February, 1953).

The problems of the letterpress and lithograph printer which arise from the variations and poor quality of some papers are described by Bedward: What the letterpress printer wants, p. 46-7; and by Bradley: What the litho printer wants, p. 47-9. The papermaker's problems, by Steer, p. 49-51, presents a summary of the papermaking process followed by a discussion on the industry's efforts to ensure ink receptivity and printability, surface smoothness, dimensional stability, and moisture control. The printers' complaints about variation in ream size, the presence of foreign matter in the sheet, static electricity, and fluff are recognized as valid by papermakers, but ways to eliminate these conditions have not yet been found. L.C.

PAPER—MERCHANDISING

HERRLINGER, ROTH. Paper merchant and paper manufacturer: a team. Am. Paper Merchant 49, no. 12: 20-1, 49-51 (December, 1952); 50, no. 1: 24, 58-9 (January, 1953).

The author gives 10 policy suggestions each to paper mills and merchants who are interested in good feeling and co-operation with each other in meeting market fluctuations. L.C.

ROSS, HAL. G. The wholesaler's function in our economy. Am. Paper Merchant 49, no. 12: 22, 48 (December, 1952).

The existence of the wholesaler is justified in that distribution is a necessary part of production and can be performed more efficiently by the middleman than by the manufacturer. The ways in which the wholesaler serves both the manufacturer and the buyer are pointed out. L.C.

PAPER—OPACITY

GIERTZ, HANS WILHELM. The opacity of paper pulps. V. The influence of bleaching. Svensk Papperstidn. 55, no. 23: 897-900 (Dec. 15, 1952). [In Swedish; English and German summaries] *cf.* B.I.P.C. 22: 594.

As a result of the bleaching operations, lignin and some of the hemicelluloses are dissolved. This causes the formation of light-scattering hollow spaces in the fiber wall. Thus the light-scattering coefficient of the pulp increases to some extent after bleaching. However, because of the increase in brightness, the opacity of paper (measured as printing opacity or contrast ratio) decreases during bleaching. The author shows that the oxidation of the hydroxyl groups of the cellulose or hemicelluloses—which may take place during bleaching and which changes the refractive index—does not influence the light-scattering properties. Hence, different bleaching agents (chlorine, hypochlorite, and chlorine dioxide) are equal in this respect. However, if the fiber structure is weakened during bleaching, the paper becomes denser and thus less opaque. This effect is particularly obvious after beating and when high pressure is used during wet pressing. Pulps bleached with chlorine dioxide may therefore be more opaque than pulps bleached with hypochlorite in the usual way. 5 tables, 1 figure, and 4 references. E.S.

WILLETS, WILLIAM R., and GEORGEVITS, LOUIS E. Some notes on opacity. Tappi 36, no. 1: 133-7A (January, 1953).

Following a brief outline of the phenomenon of opacity and its measurement in paper, including the Kubelka-Munk theory and curves, the authors discuss the effect of certain factors on practical paper opacity, such as calendering, coating, and coloring on unprinted sheets, the problem of show-through on printed samples, the type of pulp from which the paper is made, brightness, and paper fillers. It is shown that the practical consideration of opacity involves properties some of which are definable, measurable, and even predictable, whereas the effects of others are difficult to define, still more difficult to measure, and almost impossible to predict. 7 tables and 4 diagrams. E.S.

PAPER AND PULP INDUSTRY

ANON. India—forest resources and paper industry. Norsk Skogind. 6, no. 11: 328-34 (November, 1952). [In Norwegian]

The available raw materials and the present status of the Indian paper industry (exclusive of Pakistan and Ceylon) are discussed; statistical data are included. 5 tables, 3 figures, and 10 references. E.S.

ANON. Raw materials in 1952; review of the markets. World's Paper Trade Rev. 138, no. 26: 2031-2, 2034, 2037, 2045, 2050 (Dec. 25, 1952).

Conditions during 1952 on the British markets for chemical and mechanical wood pulps, esparto, rags, waste paper, chemicals and dyes, and casein are reviewed. E.S.

ANON. Review of the year; 1952, a period of recession. World's Paper Trade Rev. 138, no. 26: 1984, 1986, 1988, 1990, 1992, 1995 (Dec. 25, 1952).

Conditions in the British paper industry during 1952 are discussed, including paper control, imports and exports, developments, raw materials, associations, technical activities, and obituary. E.S.

EVEREST, D. C. The pulp and paper industry looks ahead. Southern Pulp Paper Manuf. 16, no. 1: 70, 72, 74 (January, 1953); Am. Paper Merchant 50, no. 1: 22-3, 54-5 (January, 1953); Paper Trade J. 136, no. 1: 26-8 (January, 1953); *cf.* B.I.P.C. 19: 564.

The author presents an optimistic view on the future of the pulp and paper industry, written in the same spirit as his previous paper on the "cash-register complex" of the nation. E.S.

HOBBS, ROBERT B., and WILSON, WILLIAM K. Pulp and paper. Chem. Eng. News 31, no. 1: 40-2 (Jan. 5, 1953); *cf.* B.I.P.C. 21: 411.

Production in the paper and paperboard industry was again showing a definite upward trend toward the end of 1952, following a weakness which had extended from midsummer of 1951 to July, 1952. In the pulp and paper industry, the production ratio had gradually declined from 100 in June, 1951 to 76 in July, 1952 but recovered to a level of 91 in October. The paperboard operating ratio showed a similar, but sharper decline from 103 to 71, rising to 96 in October, 1952. The optimism in the industry is reflected in a huge volume of spending and plans for new mills and modernization in the three-year period 1952-54. A significant aspect of the new projects is

the acceleration of the southward shift of the center of gravity of the pulp and paper industry. The following technical trends are reviewed: semichemical pulping of hardwoods; instrumentation in mills; the utilization of southern pine, scrub oak, agricultural residues, and tropical hardwoods; deinking; research in cellulose and lignin chemistry, including spent sulfite liquor; bleaching; testing; the increasing application of statistical quality control; and the APPA research program on instrumentation. 1 table and 1 diagram. E.S.

MØRCH, KR. The investment problems of the Norwegian pulp and paper industry. Norsk Skogind. 6, no. 12: 396-401 (December, 1952). [In Norwegian; English summary]

The development of the financial conditions of the Norwegian pulp and paper industry between the two world wars is discussed; a close study of present conditions is presented, based on figures from official sources. During the first five years following the last war, the investments covered repair and maintenance only. Although conditions improved somewhat later on, the rate of investments in the postwar period is still considered far too low, particularly if the lowered money value is taken into account. 1 table. E.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

JONES, NARD. The people in pulp and paper. Am. Forests 59, no. 1: 10-12, 46-7 (January, 1953).

The pioneer efforts of Wisconsin pulp and paper mills in the field of public relations are cited. The aim of the mills here as well as in other areas is not so much to create good relations as to maintain those it already has. A large part of the program is bent on informing the labor force and the public of paper's economic and social importance, and of the industry's contribution to conservation and forest management. 4 illustrations. L.C.

PAPER AND PULP MILLS

ANON. Costa Rica's first paper mill; kraft from Abaca fibre. Paper-Maker (London) 124, Annual no.: 82-3 (1952); *cf.* B.I.P.C. 21: 412.

The two-machine paper mill at La Perla in Costa Rica for making kraft paper from manila hemp will be in operation by the end of 1952. A brief description of some of the installations is given, all of which were supplied by British firms. 7 illustrations. E.S.

ANON. A new paper mill; Smith Stone and Knight enterprise. World's Paper Trade Rev. 138, no. 18: 1340, 1342 (Oct. 30, 1952).

The reconstruction of the war-damaged paper mill at Nechells, Birmingham, England is described briefly. 3 figures. E.S.

KAIJSER, CHRISTIAN. Pakistan's first paper mill. Svensk Papperstidn. 55, no. 23: 920-1 (Dec. 15, 1952). [In Swedish]

The author describes the first paper mill now under construction at Chandragohna in the Chittagong Hill Tracts of East Pakistan. The mill will utilize bamboo and comprise a sulfate mill with six digesters and a paper mill with three Walmsley machines, two Fourdriniers and one 14-cylinder machine. An initial output of 30,000 tons of paper is planned. 7 illustrations. E.S.

MACKLEM, HAROLD G. Expansion and improvements at St. Regis Paper Company's "Kraft Center." Paper Mill News 75, no. 50: 10-12, 14-16, 20-1, 27 (Dec. 13, 1952); *cf.* B.I.P.C. 23: 35.

The author describes the expansion program of the St. Regis Paper Co.'s mills No. 1 and 2 at Cantonment, near Pensacola, Fla., including a new Bagley & Sewall paper machine and auxiliary equipment and numerous improvements on the existing facilities of both mills. A number of units in the construction program have not yet been completed and placed in operation. A list of the principal equipment suppliers is appended. 15 illustrations of the plant and machinery. E.S.

MOON, D. G. Bowaters Southern Paper Corporation; description of new pulp and paper mills. Southern Pulp Paper Manuf. 16, no. 1: 52, 54, 58-69 (January, 1953); Paper Mill News 76, no. 5: 11-12, 14-16, 18, 20, 22, 24 (Jan. 31, 1953); Tappi 36, no. 2: 78A, 80A, 82A, 84A, 86A, 88A, 90A, 92A (February, 1953).

The plans for the new newsprint mill at Calhoun on the Hiwassee River, Tenn. and its equipment are outlined in some detail. The mill is expected to start operations in 1954; it will house two Beloit Fourdrinier machines and have an initial annual capacity of 125,000 tons of newsprint and 50,000 tons of either bleached or unbleached kraft market pulp. The newsprint furnish will consist of pine groundwood and bleached kraft pulp. 1 illustration. E.S.

PAPER TRADE JOURNAL. St. Regis mill at Jacksonville in regular production. Paper Trade J. 136, no. 3: 36-40, 42, 44, 46 (Jan. 16, 1953).

The new kraft pulp, paper, and board mill with an annual capacity of 100,000 tons of paper at Eastport, on the outskirts of Jacksonville, Fla. started operations January 14, 1953. The different facilities of the new unit are described, including the pulp mill with four digesters, chemical recovery and preparation of liquor; the steam plant with a recovery boiler, an oil-fired boiler, and a bark boiler; the paper mill with a Beloit 230-inch Fourdrinier machine with G.E. sectional electric motor drives and electronic control and a Hydrapulper for handling the broke; and an Infilco water-purification system. An adequate supply of wood will be available from the company's own holdings and from farmers and other land owners in the area. The most modern developments and devices have been installed to reduce odors and air and stream pollution to a minimum. 7 figures. E.S.

PULP & PAPER. Oregon Pulp & Paper Co. Pulp & Paper 27, no. 1: 50, 52, 54 (January, 1953).

A new woodroom with hydraulic barker and a 110-inch Sumner chipper and a caustic-extraction stage added to the bleach plant provide additional production facilities for the Salem mill of the company. Details of the new installations are given. 14 illustrations. E.S.

PULP & PAPER. Port Huron Sulphite & Paper Co.'s pulp blending dept. Pulp & Paper 27, no. 1: 30-2 (January, 1953).

The automatic system with control board for blending any desired percentages of four different types of bleached pulp and metering this pulp to three different paper machines at the Port Huron, Mich. mill is described. The mill still operates its own bleach plant, although it no longer makes pulp; about 65 tons of a wide variety of lightweight paper specialties are produced per day. 1 floor plan and 3 illustrations of the equipment. E.S.

SZEPAN, H. F. Modern washing and bleaching at S. D. Warren Co. Tappi 36, no. 1: 125-7A (January, 1953).

The continuous brown-stock washing, screening, and bleaching systems of the new pulp mill of the S. D. Warren Co. at Cumberland Mills, Maine, and the new filtration plant with three Waco filters are described. 1 illustration. E.S.

PAPER AS A TEXTILE MATERIAL

KELMINSON, DANIEL. Paper twine uses. Paper & Twine J. 26, no. 11: 47-9 (January, 1953).

The varied uses for paper twines and twisted paper products are listed; industry consumes the largest amount as cable filler. Paper-wrapped glass yarn and paper-wrapped sisal are especially popular for light tying; fine kraft cords are used for car-door weather stripping, carpet backing, and braided electrical insulation; coarse kraft and gray crepe tissue cords have a major use in seaming and welting cords, and chair seat cords, and as ties for freshly sheared wool; many other minor uses for these twines exist. To fit the right variety to a specific application, it is necessary to take into account yarn diameter, feet per pound, tensile strength, turns per foot, type of put-up, and approximate tonnage used. 3 illustrations. L.C.

KELMINSON, DANIEL. Paper twines and cords. Paper & Twine J. 26, no. 10: 31-2 (December, 1952).

A general description of paper twines and cords is given. Northern spruce kraft produces the best twisted paper products; cordage made from it is highly resistant to wear, abrasion, and cleaning. Two or more paper yarns may be twisted together, and often an inner core of sisal, spun glass, rayon, or nylon is employed. The addition of colors, resins, and various synthetics adapts paper cordage to a number of uses. L.C.

PAPER CONDITIONING

DAY, FREDERICK T. Paper expansion & contraction; causes and remedies. Paper & Print 25, no. 4: 436 (Winter, 1952).

Directions for the correct maturing and storage of the paper after it leaves the mill and for proper conditioning of the pressrooms are given. E.S.

PAPER SPECIALTIES

ANON. Dish washing eliminated. Modern Plastics 30, no. 5: 80-1 (January, 1953).

Special light-weight, "Bondware"-plastic-coated paper plate and bowl liners have been introduced for use in restaurants to reduce dishwashing labor costs, to save space and weight, and to increase the speed of service. The liners are supported by re-usable molded-melamine (Melmac) holders. 4 illustrations. L.C.

ANON. New paper outlets. Paper & Twine J. 26, no. 11: 20, 22-4 (January, 1953).

The expanding market for paper containers used in restaurant food take-out service has added another important consumer in the sea-food retailer. The paper items needed for such restaurant and delicatessen trade are listed, and the operation of four concerns in the Philadelphia area is described. 1 illustration. L.C.

ANON. The story of vegetable parchment; its properties and uses and how it is made. Paper & Twine J. 26, no. 11: 13-14, 34-6 (January, 1953).

Vegetable parchment, a pure cellulose sheet with permanent high wet strength and grease-resisting properties, is described. It is odorless, tasteless, lint-free, and highly printable. There are hundreds of types of vegetable parchment to suit numerous applications, some of which are: wrapping for butter and other dairy products, meats, lard and shortening, margarine, poultry, fish, vegetables, and fruits; as liners for vegetable crates and as retail bulk food wrapping; and "greeting-type" parchments used for diplomas, programs, and greeting cards. Industry uses various qualities in mercury batteries and photo-film developing equipment, as a dialyzing membrane, as wrappings for a variety of products, and in specialty products, such as lamp shades. 8 figures. L.C.

BARTON, J. S. Recent developments in masking overlays. J. Forest Products Research Soc. 2, no. 4: 52-3, 68 (November, 1952).

Following a general survey of the trends in plastic overlays for upgrading wood veneers from less desirable or defective species and with particular reference to paper-plastic masking overlays, the author discusses briefly the properties of the low-density masking overlay Rezon BL-200 manufactured by Crown Zellerbach Corp. with the aid of beater-addition resins. Intensive research by the company is being continued, because the production of these new materials is increasing and will continue to increase with diminishing supplies of first-grade peeler logs. 2 tables and 4 references. E.S.

CRAIG, F. A. Paper and papermaking; writings. Paper & Print 25, no. 4: 438, 440, 442 (Winter, 1952); *cf.* B.I.P.C. 23: 194.

A general description of different types of writing and printing papers is given. The following grades of writing papers are discussed: loans, parchments, and vellums; banks and bonds; ledger and account papers; and cream woves and laids. The printings which are described include: newsprint, wallpaper, mechanical printings, wood-free printings, esparto printings, imitation art, machine-coated art, book papers, cartridges, and posters. L.C.

DAY, FREDERICK T. Paper conversion and usage. No. 42 (Parts 1-5). Paper, paper products, and the Coronation. World's Paper Trade Rev. 138, no. 17: 1292-3; no. 19: 1427-8; no. 21: 1606, 1608; no. 23: 1743-4, 1746; no. 25: 1932, 1934 (Oct. 23, Nov. 6, 20, Dec. 4, 18, 1952); *cf.* B.I.P.C. 23: 421.

The possibilities open to the paper and printing trades, the paper converter, and the stationer in connection with the Coronation are discussed, first from the point of view of the selected Coronation colors and official Coronation symbols and the selection of suitable printing inks; then some of the papers and boards likely to play a big part in the festivities are reviewed. These include metal, poster, and cover papers, seals and stamps, and different types of boards for tickets in colors, showcard work, greeting cards, and display work (plain and decorated). 8 figures. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 43. Seasonal dressings, wrappings, tags and seals. World's Paper Trade Rev. 138, no. 26: 2026, 2028 (Dec. 25, 1952).

The author describes some of the materials and printing methods used in the manufacture of fancy items and paper novelties, particularly choice novelty-gift wrappings and dressings, designed for use on special occasions and during festive seasons of the year. The production programs of the converting industries are also mentioned briefly; the converters are kept busy all the year around. 5 illustrations. E.S.

DAY, FREDERICK T. Print & paper; suggestions for the Coronation. Paper & Print 25, no. 4: 413-14, 416, 418 (Winter, 1952).

English printers will be called upon this year to produce a variety of specialty jobs for the Coronation festivities. The author presents some ideas for the use of metal papers, decorative seals and labels, novelty papers for folders and covers, all-over printed wrapping paper, cellulose varnishes, and metallic print done with ink or powder. 4 illustrations. L.C.

FAYMONVILLE, W. J. Self defense for your product; protective packaging with aluminum foil. Tappi 36, no. 1: 18A, 20A, 22A, 24A, 26A, 28A, 30A (January, 1953).

This article, a general discussion of aluminum foil and foil laminates, is intended as a reference guide to data on the physical properties, techniques, and end uses of this material for packaging. Except for stiffness and bursting strength, the physical constants of laminated aluminum foil are dominated either by the carrier (paper or film), or by the foil itself, depending upon the gage of the foil and the qualities of the carrier. Laminating agents, seam and fold length, type of carrier, and gage of foil must be chosen in appropriate combination to satisfy the requirements of cost, protection, and efficient operation on the packaging equipment. Data on moisture-vapor transmission, stiffness, bursting strength, sealing techniques, and the effects of the relationship between the volume, surface area, and total-seam area of the package are presented. A table of specifications for combinations of these is given; another table presents the uses of aluminum foil for bags, fiber-canister liners, carton liners, carton overwraps, cartonless wraps, and fiber-canister labels. 3 tables and 7 figures. L.C.

PARTICLE SIZE

WORK, LINCOLN T. Size reduction. Ind. Eng. Chem. 45, no. 1: 95-8 (January, 1953).

A review is given of the 1952 literature on the basic principles and applications of size reduction and on the improvements in the devices employed. 2 illustrations and 109 references. L.C.

PATENTS

ANON. The first papermaking patent. Paper-Maker (London) 124, Annual no.: 46 (1952).

The five earliest British patents granted for papermaking inventions are discussed briefly. E.S.

PENETRATION

SINGH, KARTAR. Studies on the penetration of cooking liquors into bamboo chips. J. Appl. Chem. (London) 2, no. 12: 669-81 (December, 1952).

The present investigations concern the improvement in the process of the manufacture of pulp from bamboo, now a major raw material of the Indian

paper industry. One of the greatest difficulties in the production of good-quality pulp from bamboo at an economic yield lies in its great resistance to the penetration of cooking liquors into the interior of the chips. An attempt has been made to analyze the resistance to the flow of liquids into the interior of bamboo chips by investigating: (1) the void space in bamboo blocks, (2) directional permeability, (3) the penetrations under forced flow of the liquids, and (4) the effect of various factors on the rate of penetration. The results are compared with those from coniferous woods. These investigations show that the void space in blocks of bamboo is much smaller comparatively than in coniferous woods and not easily accessible to cooking liquors. Most of the mass movement of the liquor takes place through the vessels along the grain, and the rest of the structure offers great resistance to penetration. The only effective means of securing complete penetration of the blocks of bamboo has been found to be the application of hydrostatic pressure of the order of 100 lb./sq. in. For coniferous woods, however, the evacuation treatment is far more effective than pressure. It is suggested that the application of pressure during the early stages of the process of digestion would help to overcome most of the difficulties encountered in the pulping of bamboo. 7 tables, 16 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—FOLDING ENDURANCE

BRECHT, WALTER, and WESP, ADAM. A new method for testing folding strength. Das Papier 6, no. 21/22: 443-9; no. 23/24: 496-503 (November, December, 1952). [In German]

The construction and accuracy of the results of the Schopper folding tester (I) are criticized. The method of creasing the paper in (I) does not correspond to the folding procedure involved in practical operations; in addition, the tensile strength affects the results, so that the measurement of the actual resistance to folding is always dependent upon the breaking load or strain (II). The different types of (I) contain springs with graded tension and the results from different testers cannot be compared. Small, hardly noticeable defects of (I) or the slight wear of essential parts of the instrument cause large variations in the results obtained with different testers. The principle upon which the test is based causes a large scattering of the obtained values, so that the determination of the folding strength is the most inaccurate of all paper-testing procedures. The operation of (I) is time consuming; changes in relative humidity can therefore exert an influence. The same disadvantages hold for the so-called folding endurance testers. Although the agreement between these testers of the same type is better and the influence of tensile strength is less pronounced, the range of scattering of the obtained test values is still larger than permissible. A new method and instrument (the pressure folding tester) (III) have been developed, in which the 15-mm. wide sample strip (100 to 200 mm. in length) is subjected to 25 (single) or 50 (double) sharp folds between two rolls under a maximum pressure of 6 kg. and without (II). The folded strip is removed from (III) and its tensile strength is determined. The folding strength is expressed as the ratio of (II) of the flat and folded strip. The range of the instrument comprises basis weights of lower than 20 to over 500 g./sq. m.; in other words, tissue papers as well as heavy boards, including sheets prepared from halfstuffs and groundwood pulp, can be evaluated. The testing period is the same for all samples (six to seven minutes for a series of 10 tests). The creasing procedure may be carried out as single or double folds, whereby the latter give a sharper differentiation; for most purposes, single folding should be the standard, because it duplicates practical operations. A large amount of experimental material obtained with (III) alone or in comparison with (I) is included. The data indicate that

the scattering of individual tests amounts to ± 7% in (III) and 22% in (I); in the average of 10 tests, to ± 2.3 and 7%, respectively, with the same instrument, and to ± 3 and 15% with different instruments. The authors claim that (III) measures the actual folding resistance of paper. 6 tables, 18 figures, and 19 footnotes. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

WHEELER, GORDON C. Measurement of paper properties important in offset printing. Tappi 36, no. 1: 112-14A; discussion: 114-15A (January, 1953).

The author discusses the printing operations which are directly affected by the properties of paper under these three groups: feeding, pulling the impression, and delivery and binding. E.S.

PHYSICAL TESTING—PAPER—SIZE RESISTANCE

PRICE, DONNA, OSBORN, R. H., and DAVIS, J. W. A liquid penetration test for measuring the sizing of paper. Tappi 36, no. 1: 42-6 (January, 1953).

Quantitative ratings of the sizing of paper samples can be obtained readily by a test based on reflectance or transmittance measurements made on the sheet during penetration by a test liquid. The test is more precise than most sizing tests and gives closely reproducible results. It can be made with nearly any liquid as the penetrant, but the penetrant should be chosen with care because it must have the proper wetting power for the sample of paper which is to be tested. After the proper conditions have been established, the test can be shortened by making single transmittance or reflectance measurements. Under these conditions the test is convenient and quite rapid. 9 figures and 3 references. E.S.

PHYSICAL TESTING—PAPER—STIFFNESS

CARSON, F. T., and WORTHINGTON, VERNON. Stiffness of paper. J. Research Natl. Bur. Standards 49, no. 6: 385-91 (December, 1952); Tappi 36, no. 1: 36-42 (January, 1953); *cf.* B.I.P.C. 23: 273.

An instrument to determine the stiffness of paper is described. The specimen is bent through a given angle, and the bending moment is measured as the torque in two lengths of piano wire, between which the clamp that holds the specimen is suspended. Stiffness of paper is defined as the bending moment per unit of width of specimen producing unit curvature. This quantity was evaluated for eight types of paper, for various lengths and widths of specimen, and for bending angles from 5 to 30°. The stiffness value for a given specimen remained substantially constant when the width and bending angle were varied, but increased somewhat as the length of the specimen was increased. 6 tables, 4 figures, and 8 references. E.S.

PHYSICAL TESTING—PULP

BARDSLEY, J. H. St. Lawrence rapid routine groundwood testing equipment. Pulp Paper Mag. Can. 53, no. 13: 92-7 (December, 1952).

A method and the required apparatus are described whereby it is possible to determine on an unknown groundwood sample, in less than 10 minutes, freeness, consistency, Mullen strength, and air resistance or porosity, all on an ovendry basis. The author found that a very reliable measure of the

strength may be obtained from the porosity, so that the Mullen test need not be included in the routine. This allows the complete test to be made in less than five minutes. However, a sufficient number of samples is subjected to the Mullen test, so that a running relationship between the porosity and the Mullen test is maintained. Data are also given which show various comparative test figures obtained with samples from 34 different North American newsprint mills, including graphs which illustrate the general interrelationship of the above special tests. 2 tables, 8 figures, and 1 reference. E.S.

ROBERTS, MILTON. Physical testing of pulp. Paper Mill News 76, no. 2: 37-9 (Jan. 10, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952. The author discusses the pulp evaluation procedures of TAPPI and fiber classification as means of obtaining facts on which operators may base their reasons for changes in pulp treatment. 3 figures. E.S.

PHYSICAL TESTING—PULP—SCREEN ANALYSIS

ANDERSSON, OLLE. A study of the Clark fibre classifier. Svensk Papperstidn. 55, no. 24: 927-32 (Dec. 31, 1952). [In English; German and Swedish summaries]

In the Central Laboratory of the Swedish Paper Mills, a Clark fiber classifier (*cf.* B.I.P.C. 20: 806) was installed on which several modifications and changes were made for the purpose of improving the reproducibility of the results. The changes included better seals between the compartments; the removal of the filters in the drain pipes, draining the contents into pails and filtering them afterwards; the installation of oscillating shower pipes behind each wire screen; the installation of a revolution counter which will stop the shaft after a preset number of revolutions and cut off the shower water; the recirculation of all shower water under a constant static head; and the running of the apparatus for 600 revolutions, corresponding to 16 minutes for each test, or an increase of 11 minutes. The effect of these changes on the classifier results has been studied; the inaccuracy could be reduced from 2-9 to 1-2%. These studies were carried out with an unbleached sulfite pulp of standard quality beaten in a P.F.I. laboratory beater (*cf.* B.I.P.C. 19: 107-8) to four different grades classified according to the number of revolutions the beater was run. The fractionations were carried out according to Clark's standard method (I) and the modified technique (II). The results were statistically evaluated and indicate that the apparatus performs rather a rearrangement than a classification of fibers; nearly all fiber lengths are present in all fractions, with the exception of the fines. A comparison of the magnitudes of the obtained fractionation values and the original distribution curves gives results which are partly in favor of (I) and partly in favor of (II). The introduction of a classification factor for the characterization of each wire screen is suggested. This factor is defined as the ratio of relative weight to relative frequency. The classification factors computed from the present data appear to be different at different beating states, although no systematic variation could be established. In the first fraction, the classification factor is about 0.9 for (I) and 0.6 for (II); for the second fraction the corresponding values are 0.6 and 0.8. The other fractions were not considered in the present study. These factors give a key to the interpretation of measurements carried out in the classifier according to either of the two methods. In an ideal classifier, the factor is unity, and in the two methods investigated, it differs for different wires. 7 tables, 2 figures, and 3 references. E.S.

PLASTICS

KLINE, GORDON M. The year 1952 in review. Modern Plastics 30, no. 5: 111-12, 114, 116, 118, 120, 122, 124, 187-8, 190, 192, 194, 196-9 (January, 1953); *cf.* B.I.P.C. 22: 430.

A literature review of the developments in the plastics industry during 1952 is presented. 8 illustrations and 404 references. L.C.

MODERN PLASTICS. Materials supply and demand. Modern Plastics 30, no. 5: 57-68 (January, 1953); *cf.* B.I.P.C. 22: 430.

The supply and demand trends during 1952 and predictions concerning market conditions in 1953 are presented for the following types of plastics: phenolics, urea and melamine, the vinyls, polystyrene, cellulosics, polyethylene, acrylics, and coumarone. 9 tables. L.C.

PLASTICS—PAPER-BASE

BHATNAGAR, M. S., and SAHAI, S. N. Paper laminated boards. Indian Pulp and Paper 7, no. 5: 265-6 (November, 1952).

Preliminary laboratory experiments for preparing paper-base plastics from handmade paper, kraft paper, and filter paper, and phenol-formaldehyde resins with sodium hydroxide as the catalyst are described; boards prepared with filter paper gave the best results. An extension of the work with other papers of known composition is planned. 3 tables. E.S.

POWER

COOPER, A. M. Highlights of power plant modernization. Paper Mill News 75, no. 49: 56-8 (Dec. 6, 1952).

A few typical examples of electrical and mechanical power-generation practices are given by describing recent installations in a number of U. S. mills. 4 illustrations. E.S.

MACKLEM, HAROLD G. Power for St. Regis new mill. Paper Mill News 75, no. 49: 44-6, 48 (Dec. 6, 1952); *cf.* B.I.P.C. 23: 427.

The added steam and electric power-plant installations at Cantonment, Fla. are described, including a gas-fired furnace boiler, two Tomlinson recovery units, and a Stirling-type bark burner (all by Babcock & Wilcox), as well as two Westinghouse turbine generators and a new electrical power-distribution system. 4 figures. E.S.

PRINTING AND PRINTER'S INK

ALDERSON, A. J. Paper and the printer. II. The mill end. Paper & Print 25, no. 4: 398-400, 402, 404 (Winter, 1952); *cf.* B.I.P.C. 23: 198.

The paper mill is often responsible for the printer's problems, since proper packaging, shipping, and maturing measures are neglected at the point of origin. American methods of materials handling, especially palletizing, are recommended to the English paper industry. The problems which arise in the printer's shop because of damaged stock are described. 1 illustration. L.C.

ANNIS, H. M. [Moderator] Publication division paper and ink panel. Am. Pressman 63, no. 2: 49-52, 54, 56-8 (January, 1953).

In a panel discussion on paper and ink at the 1952 convention of the Gravure Technical Association, the following topics were considered: highlight difficulties on machine-coated papers, paper strength and running performance, ink testing for uniform delivery, the effect of sizing on rotogravure printing, coating and snap, the moisture content of the paper and color register, possible ink improvements, printability and clay filler, improved newsprint quality, and partial machine-coating on the press. L.C.

HARTNETT, JOHN B. Xerography. Print 7, no. 5: 9-15 (November, 1952); *cf.* B.I.P.C. 19: 801.

Xerography, an electro-mechanical method of dry printing is described. The basic steps of the process are: the creation of an electrical charge on the surface of a plate composed of a metal foil coated with a photoconductive insulating material; the exposure of the plate in a camera, under an enlarger, or in a contact printing frame to create a positively charged image; the application of a developing powder across the plate, the particles of which adhere to the image; the transfer of the resultant positive mirror-reversed image to a sheet of paper by passing it through a discharge machine; and the heating of the resultant direct positive print in order to fuse the developer to the paper. The last three steps of this process have been incorporated into a machine which prints at a speed of 1200 web-feet per minute and is sufficiently light for duplicating work in the office and the laboratory. Multicolor reproduction is possible. No critical defense materials such as film, chemicals, sensitized materials, or aluminum plates are needed for xerography, and almost any paper stock is suitable. 11 figures and 1 xerograph-produced specimen. L.C.

PRINTING AND PRINTER'S INK—ANILINE PROCESS

TUTTLE, D. E., and HOAGLAND, STEWART. Aniline—adolescent of the graphic arts. Print 7, no. 5: 1-8 (November, 1952).

Possibilities for the application of the aniline printing process (or "flexographic process," new name as adopted by the Packaging Institute) seem inexhaustible because of its versatility. The authors give a general description of the process, including equipment, and compare it with letterpress, lithograph, and rotary gravure printing. The packaging industry claims the most novel recent applications of aniline printing, but its use outside this industry is growing; some of these applications are described. 17 figures and 2 packaging samples. L.C.

PULP—EVALUATION

RANCE, H. F. The influence of cellulose properties upon papermaking behaviour and usage: rag and chemical woodpulp. World's Paper Trade Rev. 139, no. 1: 45-6 (Jan. 1, 1953); Paper-Maker (London) 124, Annual no.: 25-6 (1952).

The factors which relate the chemical and physical properties of rag and chemical wood pulps with the properties of the paper made therefrom are briefly reviewed. Although a fair amount of piecemeal knowledge relating pulp properties with papermaking behavior and paper qualities exists, the knowledge is unfortunately rather incoherent and does not permit the quantitative prediction of the suitability of a given pulp for a specific purpose. The possibility of developing a coherent scheme of correlation to replace pulp

evaluation methods based on imitation papermaking is discussed in a general way; no definite suggestions are given. E.S.

PYRITES

ANON. Brown Co.'s sulfur plant. Pulp & Paper 27, no. 1: 95, 98-9 (January, 1953); see following abstract.

The Dorrco FluoSolids system for the manufacture of sulfur dioxide from pyrrhotite concentrates installed at Berlin, N.H. is described briefly; it is the first installation of its kind in the pulp and paper industry. 6 illustrations. E.S.

CHEMICAL ENGINEERING. SO_2 by fluidization. Chem. Eng. 60, no. 1: 238-41 (January, 1953).

A pictured flowsheet of the fluidized-bed operation for producing sulfur dioxide from pyrrhotite at the mill of The Brown Co. at Berlin, N.H. is presented. The installation consistently roasts pyrrhotite (supplied by rail by the Vermont Copper Co.) to produce a gas strength of 13% sulfur dioxide; 15% would be expected if pyrite were used as the raw material. Within a short time, eight different paper mills and four sulfuric acid manufacturers will be operating similar systems. 1 flowsheet and 5 illustrations. E.S.

RADIOACTIVITY

DICKEY, E. E. Some possible applications of radioisotopes in the pulp and paper industry. Tappi 36, no. 1: 108-11A (January, 1953).

Following a brief outline of the fundamentals of atomic energy, the radiochemical laboratory at The Institute of Paper Chemistry and possible applications of radioisotopes in the industry are described. E.S.

REDISKE, J. H. Radioisotopic tracers in the pulp and paper industry. Southern Pulp Paper Manuf. 16, no. 1: 48, 50, 87 (January, 1953); Paper Mill News 76, no. 10: 20-2 (March 7, 1953).

The author reviews applications of radioactive isotopes in different industries and actual and possible uses in the paper industry. 7 references. E.S.

RAYON—VISCOSE PROCESS

NICOLAYSEN, V. B., and BORGIN, GERD LYSTAD. Filtration of viscose. Effect of pressure, gel particles and high speed mixing on the filtration value Kf. Norsk Skogind. 6, no. 11: 338-41 (November, 1952). [In English; Norwegian summary] *cf.* B.I.P.C. 21: 266.

The authors found that the filtration value *Kf* increases with decreasing filtration pressure, but decreases if a correction is used for the weight of the viscose. At low filtration pressures (0.5 and 1.0 kg./sq. cm.), the reproducibility is not satisfactory; at 2 kg. of pressure/sq. cm., no correction is necessary, and the reproducibility is ±5%. In satisfactorily filtering viscoses, the clogging of the filters is caused by gel particles which consist of swollen xanthated cellulose fibers. The most highly refined celluloses have the highest amount of such gel particles. The authors assume that cross linkages formed during the manufacture of the dissolving pulp are responsible for the less soluble or insoluble cellulose fibers. Stirring at high speed considerably improves the filtering properties and decreases the amount of gel particles present in the viscose. 2 tables, 6 figures, and 5 references. E.S.

SAMUELSON, OLOF, and JONSÉN, HEIMER. Investigations concerning the filtering properties of viscose. VI. Influence of variations in the sodium hydroxide concentration during the dissolution of cellulose xanthate. Svensk Papperstidn. 55, no. 24: 933-5 (Dec. 31, 1952). [In English; German and Swedish summaries] *cf.* B.I.P.C. 21: 111.

The filtering properties of dissolving spruce sulfite pulps prepared with different concentrations of sodium hydroxide (I) during the dissolution were studied. The results show that when the xanthate is treated with (I) of low concentration at the beginning of the process—increasing the concentration to its final value at a later stage of the agitation period—a viscose with poorer filtering properties is obtained than when the entire amount of (I) is present in the dissolving liquor from the very beginning. However, when the xanthate is first agitated (kneaded) with a solution of high (I) concentration which is afterwards diluted with water to the standard concentration, a considerable improvement in the filtering properties results. This principle is applied in practice in vacuum xanthate kneaders. These results are in agreement with the assumption that the filter-clogging particles consist of partially xanthated cellulose and other polymer carbohydrates which are fragments of the original fibers. The dissolution of the fiber fragments is facilitated at higher (I) concentrations, particularly if the treatment is supported by mechanical agitation. 5 tables and 4 references. E.S.

RESIN, SYNTHETIC

STAFFORD, R. W., and SHAY, J. F. Coatings. Anal. Chem. 25, no. 1: 8-11 (January, 1953); *cf.* B.I.P.C. 22: 523.

This review covers chemical and physical analytical methods applicable to organic high polymers and associated oils, waxes, pigments, and plasticizers, as disclosed in the literature during 1952. The scope of materials includes lacquers, varnishes, paints, and organic finishes for and on paper, textiles, leather, and metals. 138 references. E.S.

SALESMEN AND SALESMANSHIP

METCALFE, LYNE S. Classifying your customers. Paper & Twine J. 26, no. 10: 10-11, 26 (December, 1952).

A method of gathering and classifying data on the psychology of the individual sales prospect is described. Salesmen, who have the opportunity to observe clients in person, submit character descriptions to the letter-writing office force. These analyses are classified in a "psycho-file" to guide the sale correspondent's approach. 2 illustrations. L.C.

ROSS, HAL. Selective selling through monthly sales reports. Paper Sales 13, no. 1: 16-17, 54 (January, 1953).

The advantages of requiring a monthly sales report from each salesman are outlined, and the operation and application of such a system are described. 3 illustrations, 2 of which are report forms. L.C.

SETUP BOXES

ANON. Prize winner . . . does "idea selling" pay? Am. Boxmaker 42, no. 1: 9-11, 13 (January, 1953).

Congress Paper Box Co., Chicago has built its trade in prize-winning setup boxes on a sales approach which attempts to give the customer a complete merchandising idea for his product rather than a box alone. The wide

variety of accounts which the company handles are listed, and some of its "idea-selling" experiences are outlined. 16 illustrations. L.C.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. Bags replace wrapping operation. Packaging Parade 21, no. 240: 94-5 (January, 1953).

Large printed machine-filled bags developed by Bemis Bro. Bag Co. replace the manual wrapping of Balsam-Wool batt insulation; a considerable saving in labor costs results, and a better-looking package is turned out. 3 illustrations. L.C.

SHIPPING CONTAINERS—TESTING

MACNAIR, C. S. Use of electronic gages to determine the fatigue point in corrugated containers. Tappi 36, no. 1: 138-42A (January, 1953); Fibre Containers 38, no. 1: 70-1, 74-81 (January, 1953).

A careful study seemed to indicate that all corrugated containers may fail from the inability of the board itself to withstand being forced into a compound curve (the curvature forming both across the grain and with the grain of the paper at the same time). In devising a test for measuring the limits of elasticity in the formation of a compound curve, six Baldwin Southwick electronic gages (which are very sensitive to curvature or distortion in the long direction of their measurement) were placed in positions determined by trial and error on an empty container which was then subjected to the Conbur crush test; after 10 impacts each with three different sides of the container with the trip mechanism set at one foot, the signal of each electronic gage was measured for distortion; the cycle was then repeated with the trip mechanism set for two and three feet. The conclusions from these tests seem to indicate that corrugated containerboard behaves in a manner similar to plate glass. It will bend either with the grain or across the grain a great distance before the limit of elasticity has been reached. When it has been forced into a compound curve—i.e., forced to a curvature in two directions at once, the limit of elasticity is very low. A differential of 400 microinches per inch in the curvature of a panel between curvature measurements made in one direction and the curvature measured at right angles to it seems to be the limit of elasticity; beyond this point, fracture becomes inevitable. 12 figures in the first, and 20 in the second reference. E.S.

STARCH

PEAT, STANLEY, WHELAN, W. J., and THOMAS, GWEN J. Evidence of multiple branching in waxy maize starch. J. Chem. Soc.: 4546-8 (November, 1952).

Waxy maize starch (amylopectin) was hydrolyzed with dilute crystalline β-amylose to maltose and limit β-dextrin: further hydrolysis of the latter with debranching R-enzyme and the dialyzable portion was fractionated on a charcoal-Celite column; glucose was not detected, but maltose and maltotriose were isolated (ratio of 1.45 to 1) together with maltohexaose and a continuous series of higher dextrins: maltotetraose and maltopentaose were not formed. These observations favor the multiple and random branching of the formula of Meyer and Bernfeld (*cf.* B.I.P.C. 11: 63-4). J.C.W.

STATIC ELECTRICITY

KRÜGER, KARL. The problem of static elimination during the conversion of chemical fibers. Reyon, Zellwolle u. Chemiefasern 30, no. 11: 573-7 (November, 1952). [In German]

The author reviews the procedures in use at present for removing static charges formed in synthetic fibers (including viscose) during the conversion processes through (*a*) proper conditioning of the fibers and air conditioning of the room, (*b*) ionization of the surrounding air, and (*c*) treatment with antistatic agents. A list of patents covering such agents is included. In conclusion, several methods for measuring the electrostatic behavior of synthetic fibers are described. 1 diagram and 12 references. E.S.

STATIC ELECTRICITY IN PAPER

MILL, C. C. Static electricity in printing and packaging; its origin and treatment. Bull. no. 11. Leatherhead, Printing, Packaging and Allied Trades Research Assoc., 1952. 36 p. [Confidential to members of PATRA] *cf.* B.I.P.C. 9: 580.

This is a revision of the previous bulletin (now out-of-print) which has been brought up to date; it is based on published data and gives information on the origin of static electricity in general and in paper and plastic films in particular, the detection of static charges, and methods for their reduction or elimination. A list of suppliers of detectors and static neutralizers (principally British firms) is appended. 9 figures and 78 references. E.S.

STATISTICAL METHODS

PURCELL, W. R. Concepts of quality control. Tappi 36, no. 1: 1-4 (January, 1953).

Statistical quality control in the pulp and paper industry is the common ground between the Statistics Committee of TAPPI and the American Society for Quality Control. A knowledge of the problems encountered by the latter is of value to the former. One important problem is lack of mutual understanding within supervisory and technical staffs. To promote such understanding, various concepts of quality control are discussed, including those which relate to procedures in setting tolerances, sampling for inspection, making acceptance and rejection decisions, using inspection data to control processes, analyzing process data, and planning and executing experiments. The mutual understanding provided by these concepts is vital, for success in quality control depends on co-ordinated effort. E.S.

STEAM POWER

ANON. Power efficiency. World's Paper Trade Rev. 138, no. 21: 1578, 1580, 1583 (Nov. 20, 1952).

The advantages of the Oldbury chain-grate stoker for the efficient utilization of low-grade fuels and of the Danks Economic boiler are outlined; the latter requires about half the floor space of a conventional Lancashire boiler. 2 figures. E.S.

ANON. Steam and power plant extensions at Fraser Companies, Ltd. Paper Mill News 75, no. 49: 91-2 (Dec. 6, 1952).

The boiler-plant and turbine-room extensions at the Madawaska, Me. mill of the company are described. E.S.

ANON. Power expansion at Thilmany. Paper Mill News 75, no. 49: 116 (Dec. 6, 1952).

The expansion program includes the installation of a new Babcock & Wilcox coal-fired boiler, a new recovery boiler, a noncondensing-extraction turbine generator, and an extraction-condensing turbine generator. A new

hot-process softener followed by a Zeolite system was installed by the Permutit Co. A new turbine room was built to house the two new turbines, with space provided for the installation of a third unit in the future. The recovery boiler is being housed in a new building adjacent to the present recovery building. At the completion of the program early in 1953, Thilmany will be independent of outside power sources in times of low water. E.S.

ANON. The power plant at Elk Falls Company. Paper Mill News 75, no. 49: 88-9 (Dec. 6, 1952); *cf.* B.I.P.C. 23: 114.

This is the same article previously published under the name of Puppyn, H. L. 2 illustrations. E.S.

KEETH, GROVER. Report on power plants—1952. Paper Mill News 75, no. 49: 40, 42, 58 (Dec. 6, 1952).

The author reviews the trends in power plants during the past year, including improved heat balances, the use of higher steam pressures, bark burning and refuse disposal, recovery boilers burning waste liquors, Diesel engines, gas turbines, distribution voltages, the selection of variable speed drives, the appointment of instrumentation engineers, and the selection of fuel and coal stokers. E.S.

MYERS, R. O. Highly efficient operation of new power plant at Fibreboard Products. Paper Mill News 75, no. 49: 110, 112-15 (Dec. 6, 1952).

The power plant of the San Joaquin Division of the company at East Antioch, Calif. is described. It includes two power boilers fired with commercial fuels and one Tomlinson recovery boiler; an integrated furnace boiler for burning bark is being erected which will also have supplementary fuel-oil hand firing. The power plant is equipped with three 5000 Kv.-amp. turbogenerators which furnish 100% of the mill's total electrical load. In connection with the bark-burning boiler installation, the feed-water system is being converted from a sodium-Zeokarb cold softener to a hot-process, hot-zeolite system, followed by the feed-water evaporators in triple effect. Details of the different units and the over-all economy are given. 1 flow-sheet and 8 illustrations. E.S.

STEAM TURBINES

ANON. Turbines boost output at Northwest. Paper Mill News 75, no. 49: 64, 66, 68 (Dec. 6, 1952); Paper Ind. 34, no. 9: 1077-8 (December, 1952).

The installation of two Worthington gear-drive steam turbines on two paper machines of the Northwest Paper Co. at Cloquet, Minn. has increased production 12 and 13%, respectively, effected improvements in paper quality, and reduced supervision and maintenance costs of the equipment. Details of the installations are given. 7 illustrations in the first, and 5 in the second reference. E.S.

STRAW

BOESEN, C. E., and KRUSE, E. FLINDT. Straw pulp and its suitability as a raw material in the paper industry. Svensk Papperstidn. 55, no. 23: 885-96 (Dec. 15, 1952). [In Danish]

Following a brief general introduction on the use of straw pulps in paper manufacture in different parts of the world, a detailed account of experi-

mental monosulfite cooks with Danish wheat and rye straw, bleaching, strength properties of the pulps, and papermaking results with mixtures of bleached straw and bleached sulfite pulps in the manufacture of writing and printing (offset and duplicating) papers is given. The suitability of straw pulp for supplementing the raw materials available to the Danish paper industry for certain purposes is emphasized. 16 tables and 8 figures. E.S.

STREAM POLLUTION

ROTHCHILD, H. A. Stream pollution. Tappi 36, no. 1: 129-33A (January, 1953).

The author discusses legal (current applicable laws) and technical aspects of stream pollution, as well as the public-relations phase of the problem. E.S.

RUDOLFS, WILLEM, and HANLON, WILLIAM D. Color in industrial wastes. IV. Effect of light on certain wastes. Sewage Ind. Wastes 25, no. 1: 66-9 (January, 1953); *cf.* B.I.P.C. 23: 359.

A study was made to determine the effect of sunlight and ultraviolet light on the color characteristics of various industrial wastes and to determine the effect of industrial wastes on the temperature rise of stream waters as a result of sunlight absorption. Sunlight and ultraviolet light (2537 A.) are effective for reducing the color of rag cooking liquor, gum, and yeast wastes. On the other hand, they increase the color of spent sulfite liquor. The presence of highly colored wastes in stream waters has little effect on the rate and extent of temperature rise resulting from sunlight absorption. 1 table, 5 figures, and 1 reference. E.S.

SULFITE PROCESS

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Sulphite Committee.* A bibliography of papers on the sulphite process. Proc. Tech. Sect., Can. Pulp Paper Assoc. 38: 316-20 (1952).

This bibliography lists papers pertaining to the sulfite process which have been published in the Canadian Technical Section Proceedings from 1926 to 1951; the material is arranged by subjects and authors. E.S.

POTTER, G. J. C. A review of the literature on the sulphite process from September, 1950 to August, 1951. Proc. Tech. Sect., Can. Pulp Paper Assoc. 38: 321-5 (1952); *cf.* B.I.P.C. 21: 732.

Continuing previous compilations, the literature on the sulfite process is reviewed under the following headings: wood quality; sulfur and sulfur consumption; acid making; liquor composition; digester equipment and control, circulation, etc.; and penetration and pulping reactions. 45 references. E.S.

SULFUR DIOXIDE

SCHWARTZ, S. Papermakers challenge the sulfur shortage. Paper Trade J. 136, no. 5: 18-19 (Jan. 30, 1953).

The possibilities of low-cost production of sulfur dioxide gas from spent oxide and dirty or contaminated sulfur (a waste product resulting from the purification of manufactured gas) are outlined. Cost data are included, according to which a ton of 8-10% sulfur dioxide gas can be produced for $11.74 in a plant designed to burn 40 tons of spent oxide per day. 1 table and 1 flowsheet. E.S.

SURFACE AREA

JOPLING, D. W. The determination of the specific surface of barium sulphate: a comparison of results by different methods. J. Appl. Chem. (London) 2, no. 11: 642-51 (November, 1952).

A description is given of the pipette and centrifuge methods of determining grain-size distributions by sedimentation, and results are presented for a number of barium sulfate powders. From the size-distribution curves, the specific surfaces are calculated and compared with values obtained by air permeability, dye adsorption, and a light-extinction method. The results for the dye-adsorption and air-permeability methods are shown to be in good agreement with each other, but do not always agree with the values calculated from the size distribution. It is suggested that this is caused by aggregates, instead of discrete particles, which settle in the sedimentation analysis; this view is supported by electron micrographs. The failure of the optical method is attributed to the fineness of the powders. 6 tables, 8 figures, and 18 references. E.S.

SURFACE PHENOMENA

HARRIS, B. L. Adsorption. Ind. Eng. Chem. 45, no. 1: 24-31 (January, 1953); *cf.* B.I.P.C. 22: 441.

The contributions made during the past year to the field of industrial applications of adsorption are reviewed; much interest has been shown recently in the use of adsorptive means for resolving mixtures of gases or of liquids in quantity. Sections on surface area and porosity studies, chromatography, liquid phase adsorption, the preparation and properties of various adsorbents, chemisorption, and the thermochemistry of adsorption are included. 1 illustration and 315 references. L.C.

TAILINGS

OTTAR, HALDOR. Refiner studies in the groundwood industry. Part I. Refining experiments with the Haug Kollermill and the Bauer double-disk refiner. Norsk Skogind. 6, no. 12: 411-18 (December, 1952). [In Norwegian; English summary]

To meet the demand for the better refining of groundwood rejects, new refiner constructions have been installed in different Norwegian groundwood mills. Comparative experiments have been carried out with different types of equipment and the results are discussed. The present article deals with the Bauer double-disk refiner (I) and the Haug Kollermill (II). It is shown that the two machines treat the coarse groundwood rejects in quite different ways. (I) produces a long-fibered, high-quality pulp at a high power consumption. (II) produces a low-strength pulp with short fibers; its power consumption, however, is very low, probably lower than that for any other refiners employed in the groundwood industry. 2 tables, 13 figures, and 4 references. E.S.

UPKEEP PAINTING

CORROSION LIMITED, *London, England.* Metal preservation. World's Paper Trade Rev. 138, no. 26: 1996, 1998 (Dec. 25, 1952).

The anticorrosion protection and rust-inhibiting properties of zinc-rich paints, a British wartime development, are described; the protective properties are particularly good at the point of any break in the coating. New products for application to wet iron or steel surfaces (Glopane Wet) and Glopane Cold Galvanising for the coating of surfaces, which cannot be treated in any other way, and their particular advantages are outlined. E.S.

VISCOSITY

ROSEVEARE, W. E., and POOR, LOUISE. Method of determining intrinsic viscosity from data on one concentration. J. Polymer Sci. 10, no. 1: 126 (January, 1953); *cf.* B.I.P.C. 22: 9.

An easy way of solving the Martin equation for intrinsic viscosity is proposed which employs this equation in parametric form: $[\eta] = X/k'c$ and $Xe^{X} = k'\eta_{sp}$. 3 references. K.W.,Jr.

SCHURZ, JOSEF. Shear dependence of the viscosity-concentration equation. J. Polymer Sci. 10, no. 1: 123-5 (January, 1953).

An expression for the dependence of the coefficient k' in the viscosity-concentration equation upon rate of shear is derived. 1 table and 6 references. K.W.,Jr.

WAGES

MOHR, FRED W. Wages in pulp, paper, and paperboard mills, April, 1952. Monthly Labor Rev. 75, no. 6: 626-9 (December, 1952); *cf.* B.I.P.C. 21: 736.

According to a survey made by the Bureau of Labor Statistics, production workers in the pulp, paper, and paperboard industries averaged $1.52 an hour in April, 1952, exclusive of premium pay for overtime and late-shift work. Hourly earnings of individual workers ranged from less than 90 cents to more than 2.50; the work force consists principally of men. The wage differences in 46 selected occupations of the industry are shown in tabular form; regional differences and related wage practices (length of work week, shift work, paid vacations, paid holidays, and insurance or pension plans) are also discussed. 2 tables. E.S.

WAXES

WINANS, C. F. Prevention of oxidation in waxes and blends. Am. Paper Converter 27, no. 1: 20-1, 54 (January, 1953); *cf.* B.I.P.C. 23: 363.

Following a brief discussion of the reasons for the deterioration of waxes and wax blends, the action of inhibitors and the requirements of efficient antioxidants are described. Four commercially available inhibitors were selected for a comparison of their effectiveness in an accelerated oxidation test (*cf.* B.I.P.C. 19: 834) with several waxes and wax-polyethylene blends: di-*tert*-butyl-*p*-cresol (I), 2,2'-methylene-bis (4-methyl-6-*tert*-butyl phenol) (II), nordihydroguiaretic acid (III), and 3-*tert*-butyl-4-hydroxyanisole (IV). Each of the four inhibitors tested was found effective in retarding wax deterioration as judged by peroxide generation, color, and odor development. On an equivalent weight basis, (III) appears somewhat superior to the others, except for generation of color. On a cost basis, (I) is superior; it also retards color development effectively. (III) and (IV) have already received approval from the Food and Drug Administration for use directly in foods at a concentration of 0.01%; (I) is now undergoing tests for securing a similar approval. No literature references on the toxicity of (II) could be found. 2 figures and 10 references. E.S.

WELDING

COLLINS, —, SHRUBSALL, —, and WILSON, —. Unionmelt cladding of mild steel roll by series-arc technique. Paper Mill News 75, no. 51: 16 (Dec. 20, 1952).

The advantages of the series-arc technique of Unionmelt welding with various types of alloys are described by a number of applications to mild-steel rolls. 2 illustrations. E.S.

WET STRENGTH

KINDALL, J. VERNON, and DAVIDSON, JOHN B. Methods of increasing the efficiency of wet-strength resins. Tappi 36, no. 1: 12-14 (January, 1953).

A study has been made to determine the conditions required for the optimum efficiency of a cationic urea-formaldehyde resin. At the point of addition of the resin, it was found that the wet strength was favored by a low pH and the absence of sizing materials. Following resin addition, longer contact time of the resin with the pulp was found to decrease the plugging of the felt with resin. These longer contact times can be obtained practically, since the action of the jordan was not found to reduce measurably the wet strength obtained. Reduced maintenance costs can be obtained at a higher pH on the machine, although with a reduction in the wet strength. 3 tables and 2 references. E.S.

WHITE WATER

RUDOLFS, WILLEM, and AMBERG, HERMAN R. White water treatment. V. Aeration with nonflocculent growths. Sewage Ind. Wastes 25, no. 1: 70-8 (January, 1953); *cf.* B.I.P.C. 23: 364.

The system of nonflocculent growth aeration, effective for a number of strong soluble organic wastes, was studied for the B.O.D. reduction of white water. About 60% of the B.O.D. of white water is exerted by the dissolved solids. Laboratory studies pertaining to the feasibility and factors affecting the B.O.D. reduction of white water showed the methods to be effective, efficient, and readily controlled. The most important factors are temperature, air supply, and B.O.D. concentrations. The volume of seed and the pH of the waste do not appear to be of critical importance. Temperatures in the mesophilic range (30 to 40°C.) are about as effective as temperatures in the thermophilic range in respect to the percentage B.O.D. reduction. Aeration time, waste concentration, and percentage B.O.D. reduction are related. At a temperature of 30°, about 80% of the applied B.O.D. can be removed with a B.O.D. load of about 200 lb./1000 cu. ft. of aeration capacity per day. 3 tables, 7 figures, and 5 references. E.S.

WOOD—CHEMISTRY

KURTH, E. E., FOSTER, D. H., and INGLES, D. L. The analysis of some Tasmanian timbers. Australian J. Appl. Sci. 3, no. 4: 384-94 (December, 1952).

An investigation of the chemical composition of the following samples of different Tasmanian woods has been made to determine their suitability for conversion to sugar by a dilute-acid process: *Eucalyptus regnans, E. obliqua, E. viminalis, E. globulus, E. gigantea, Nothofagus cunninghamii, Atherosperma moschatum, Acacia dealbata, A. melanoxylon, Casuarina (quadrivalvis?), Phyllocladus rhomboidalis, Athrotaxis selaginoides,* and *Dacrydium franklinii.* The last-named seven have been analyzed for the first time. In addition, determinations of the total sugar obtainable by hydrolysis with 72% sulfuric acid have been compared with results obtained on hydrolysis of the samples with 2% sulfuric acid at 173°C. in a small percolation apparatus. 7 tables and 28 references. E.S.

WOOD—EXTRACTIVES

CAMPBELL, R. B., and ROBERTSON, J. MONTEATH. The structure of nootkatin; an x-ray determination. Chemistry & Industry no. 52: 1266-7 (Dec. 27, 1952).

An x-ray investigation of a few crystals of the copper complex of nootkatin established the position of the two side chains (isopropyl and 3-methyl-2-butenyl) beyond any reasonable doubt; the structure appears to be in agreement with the facts given in the following abstract. The compound is considered to be β-isopropyl-γ-(3-methyl-2-butenyl) tropolone. 1 figure and 2 references. E.S.

ERDTMAN, H., and HARVEY, W. E. The chemistry of the natural order *Cupressales*. X. Nootkatin. Chemistry & Industry no. 52: 1267 (Dec. 27, 1952); *cf.* B.I.P.C. 23: 364.

Chemical evidence is presented which makes it seem probable that nootkatin contains two side chains attached to the tropolone ring and that the substituent groups are isopropyl and 3-methyl-2-butenyl. When the methyl ether of nootkatin was treated with methanolic sodium methoxide at 150° in a sealed tube, it gave—among other products—an acidic substance which, on oxidation with dilute nitric acid, yielded what is believed to be trimellitic acid. 4 references. E.S.

GRIPENBERG, JARL. Flavanones from the heart wood of *Larix decidua* Mill. (*L. europea* D C.). Acta Chem. Scand. 6, no. 8: 1152-6 (1952). [In English]

Dihydrokaempferol and dihydroquercetin have been isolated from the heartwood of the European larch. The former is shown to be identical with aromadendrin previously isolated from *Nothofagus dombeyi* and *Eucalyptus* spp.; the latter is shown to be identical with taxifolin previously isolated from *Pseudotsuga taxifolia*. The two flavanones were separated by chromatography on a column of powdered cellulose. 13 references. E.S.

GRIPENBERG, JARL, and LINDAHL, BJARNE. Constitution of resin phenols and their biogenetic relations. XV. Some new derivatives of pinoresinol. Acta Chem. Scand. 6, no. 8: 1147-51 (1952). [In English]

The preparation of two new derivatives of pinoresinol, dinitropinoresinol and diaminopinoresinol, is described. Unsuccessful attempts have been made to oxidize the aromatic rings in pinoresinol to carboxylic groups. 5 references. E.S.

LINDBERG, BENGT. Constitution of resin phenols and their biogenetic relations. XIV. *Epi*-pinoresinol. Acta Chem. Scand. 4, no. 2: 391-2 (1950). [In English] *cf.* B.I.P.C. 20: 599.

The preparation of epipinoresinol diacetate from pinoresinol and of epipinoresinol (melting at 140.5-141.5°C.) from the diacetate is described. Dimethyl sulfate and epipinoresinol formed the dimethyl ether, melting at 129-130°. 3 references. E.S.

LINDSTEDT, GÖSTA, and MISIORNY, ALFONS. Constituents of pine heartwood. XXIX. A synthesis of strobochrysin dimethyl

ether (5,7-dimethoxy-6-methylflavone). Acta Chem. Scand. 6, no. 8: 1212-16 (1952). [In English] *cf.* B.I.P.C. 23: 134, 286.

5,7-Dimethoxy-6-methylflavone (melting at 170-171°C.) and -flavanone (melting at 130-131°) have been synthesized by unambiguous methods. The flavone has been shown to be identical with the dimethyl ether of strobochrysin, which therefore must be 5-7-dihydroxy-6-methylflavone. The evidence now available indicates that strobobanksin belongs to the 6-methyl series (3,5,7-trihydroxy-6-methylflavanone). 1 table and 8 references. E.S.

PIGMAN, WARD, ANDERSON, ERNEST, FISCHER, R., BUCHANAN, M. A., and BROWNING, B. L. Color precursors in spruce- and western hemlockwoods and inner barks. Tappi 36, no. 1: 4-12 (January, 1953).

Sprucewood inner bark and western hemlockwood contain materials which develop a red color upon treatment with mineral acids, preferably in the presence of alcohols. These materials appear to be leucoanthocyanins. The conditions affecting the tests have been studied systematically, and two semi-quantitative methods for their determination are described. The leucoanthocyanins are present in black spruce inner bark and cambium but not in sprucewood. Related materials are found in all fractions of western hemlockwood, the inner bark, and the cambium in water-soluble and water-insoluble forms. Purified phlobatannins appear to be rich in leucoanthocyanins. The composition of the leucoanthocyanin from black spruce inner bark was studied. A methylated derivative and a crystalline acetate were prepared. It appears to have the formula $C_{15}H_9(OH)_3(C_6H_{11}O_5)$ and to be the hydroxylated derivative of chalcone. 5 tables, 7 figures, and 23 references. E.S.

WOOD—IDENTIFICATION

STEARNS, J. L., and HARTLEY, CARL. Physico-chemical methods for wood diagnosis. J. Forest Products Research Soc. 2, no. 4: 58-61 (November, 1952).

The authors describe the possibilities of chemical reagents (including fluorescent stains) for the identification of wood species, the detection of infecting organisms, and the differentiation of sapwood and heartwood. 23 references. E.S.

WOOD—SACCHARIFICATION

KURTH, E. E., FOSTER, D. H., INGLES, O. G., RALPH, B. J. F., and SHIPP, M. H. R. The acid hydrolysis of Australian woods; hydrolysis of the wood of *Eucalyptus obliqua* L'Herit by a percolation technique. Australian J. Appl. Sci. 2, no. 1: 184-99 (March, 1951).

The acid hydrolysis of the wood of a Tasmanian species of *E. obliqua* L'Herit has been studied in a specially designed percolator at temperatures of 162, 173, and 183°C. and at sulfuric acid concentrations of 0.5, 1, and 2%. Pentose, hexose, free furfural, and organic acids were determined in the hydrolyzates; the results are given in tabular form. The main purpose of the investigation was to determine the conditions under which a high yield of reducing sugars could be obtained with a minimum of secondary decomposition products. The results indicate that approximately the same effects can be obtained by various combinations of acid concentration and temperature; for commercial conditions, however, it would seem that a prolonged hydrolysis with weak acid at a temperature of 183° or even a

little higher would give the highest yields. 8 tables, 8 figures, and 7 references. E.S.

WOOD ROOM

RICHTER, R. C. Wood preparation. Paper Mill News 76, no. 2: 15-18 (Jan. 10, 1953).

This is one of the papers presented at the first Annual Pulp and Paper Conference held at the University of Florida in September, 1952. The author describes acceptable wood for the sulfate process, woodyard and woodroom equipment, uniformity of chips, and the utilization of the bark as fuel, with particular reference to the operations at St. Mary's Kraft Corp., St. Mary's, Ga. 1 table. E.S.

WOOD TRANSPORTATION

WIBSTAD, KJELL. Wood transportation in Norwegian forests. Norsk Skogind. 6, no. 11: 342-6 (November, 1952). [In Norwegian; English summary]

The correct handling of logs in the forest is discussed in connection with the subsequent transportation from the forest to the mills. If this relationship is not given consideration, mechanized handling may involve higher instead of lower transportation costs. 7 illustrations. E.S.

WOOD WASTE

CASSEB, PAUL E. Using sawdust in new fields. Chemurgic Dig. 12, no. 1: 4-6 (January, 1953).

The utilization of sawdust in a variety of situations and products is growing. Some examples of its more recent uses developed by H. L. Twining of San Antonio, Texas are: on miniature golf courses; in meat packers' refrigerators and smoke houses; in plastics; as insulation, packing, and fertilizer; and in mothproofing. The most significant application of sawdust thus far is in "Kingseal" and "Queenseal," two recently developed oil drilling-mud additives; both are a mixture of graded sawdust and selected textile fibers. The properties of these sealers are discussed. 1 illustration. L.C.

X-RAY RESEARCH

BJØRNHAUG, A., ELLEFSEN, Ø., and TØNNESEN, B. A. Interpretation of x-ray diagrams of unoriented organic chain polymer substances. 2. Polymethyl methacrylate (Perspex). Norsk Skogind. 6, no. 12: 402-7 (December, 1952). [In English; Norwegian summary] *cf.* B.I.P.C. 23: 135.

The x-ray diagram of an unoriented sample of polymethyl methacrylate is structurally interpreted according to the methods described in the first part of this series. A molecular model construction has been prepared and is described. The planar zigzag chains are shown to be contradictory to the experimentally obtained curves. A nonplanar structure is suggested which is at least not contradicted by the experimental data. 1 table, 8 figures, and 6 references. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets, or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

RAPP, JULIUS. Envelope seam gum and a method of preparing it. U. S. patent 2,624,681. Filed Sept. 21, 1949. Issued Jan. 6, 1953. 12 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 106-210]

An envelope-seam adhesive consists of the following components which may be combined in a variety of proportions as specified: modified starch of 25 to 27 gram viscosity, urea, nonreducing sugar, and a buffering system consisting of monosodium phosphate and disodium phosphate. Minor proportions of a bleaching agent, such as sodium bisulfite, as well as a small amount of a foam-preventing agent, such as tributyl phosphate, may be added. L.C.

ASBESTOS

NOVAK, IZADOR J. Asbestos dispersions and method of forming same. U. S. patent 2,626,213. Filed Dec. 21, 1948. Issued Jan. 20, 1953. 14 claims. Assigned to Raybestos-Manhattan, Inc. [Cl. 92-3]

A stable, aqueous, colloidal dispersion of chrysotile asbestos fibers containing an organic chrysotile asbestos colloidizing agent (e.g., sulfated or sulfonated esters, alcohol sulfates, alkyl aryl sulfonates, fatty acid derivatives, and fatty acid soaps) is claimed as a new composition of matter. High-strength smooth paper webs can be produced in varying thicknesses from these dispersed fibers. 6 figures. R.C.R.

BAGASSE

ATKINSON, JAMES D., JR., and ROGERS, LINWOOD N. Acid-alkali process for the preparation of cellulose fibers. U. S. patent 2,625,474. Filed June 30, 1947. Issued Jan. 13, 1953. 3 claims. Assigned to Buckeye Cotton Oil Company. [Cl. 92-9]

An eight-step process for pulping bagasse (I) is described. The steps include: (1) mechanical disintegration and washing, (2) 2% nitric acid treatment at 80-110°C. for one hour, (3) alkaline extraction with 1-3% sodium hydroxide at 95° for one hour, (4) mechanical agitation, (5) alkaline

extraction (as in step 3), (6) chlorination (7) alkali steep, and (8) rebleaching with chlorine or a chlorine-yielding agent. (I), pulped in the above manner, can be used for the best grades of paper and viscose rayon. R.C.R.

BARKERS AND BARKING

ANDERSSON, AXEL E. Machine for removing bark from logs. U. S. patent 2,623,558. Filed June 10, 1949. Issued Dec. 30, 1952. 6 claims. Assigned to Söderhamns Verkstader Aktiebolag. [Cl. 144-208]

A debarking machine capable of handling logs of different diameters and hardness, including those which are crooked and knotted, comprises a hollow-head type apparatus with pneumatically pressed barking tools; the device, rotating around the axis of the log and feeding it forward in a longitudinal direction, combines both friction and peel-barking action. The controlled-pressure tools consist of a rod which is directed inward to the surface of the log and carries a blunt bark-removing portion and an inclined peeler portion. Planing tools work in conjunction with these to peel off any remaining bark and bast. 8 figures. L.C.

EKLUND, HENRIK J., and MILLER, CLARENCE W. Portable log debarker. Canadian patent 489,448. Filed April 5, 1949. Issued Jan. 6, 1953. 7 claims. Assigned to D. J. Murray Manufacturing Co.

The construction of a revolving chain-type portable debarker capable of handling logs of various diameters and lengths is covered. This is the same as U. S. patent 2,608,223 (Aug. 26, 1952); *cf.* B.I.P.C. 23: 137. 6 figures. L.C.

PIISPANEN, VAINO. Log debarking device. Canadian patent 489,540. Filed May 26, 1948. Issued Jan. 13, 1953. 9 claims.

A log-debarking device comprises a rotatable carrier (I), a bark peeler (II) pivotally connected to (I), and pressure-fluid actuated means carried by (I) for yieldingly pressing (II) into engagement with the log. 5 figures. R.C.R.

SHAW, ERNEST C. Hydraulic log barking apparatus. Canadian patent 488,831. Filed April 18, 1951. Issued Dec. 16, 1952. 8 claims. Assigned to Allis-Chalmers Manufacturing Company.

A mechanism for barking and cleaning logs by a number of oscillating hydraulic jets is described. The mean direction and amplitude of each jet can be varied to fit the circumference of each log. This is the same as U. S. patent 2,552,871 (May 15, 1951); *cf.* B.I.P.C. 21: 742. 4 figures. R.C.R.

SHAW, ERNEST C. Hydraulic log barking apparatus. Canadian patent 488,832. Filed Oct. 26, 1951. Issued Dec. 16, 1952. 7 claims. Assigned to Allis-Chalmers Manufacturing Company.

A hydraulic barker is provided with a tiltable parallel roll mechanism which handles the log for barking and then laterally discharges it. This is the same as U. S. patent 2,575,302 (Nov. 13, 1951); *cf.* B.I.P.C. 22: 291. 2 figures. R.C.R.

BLEACHING

MCEWEN, ROBERT L., and SHELDON, FRED R. Treatment of chemical pulp. Canadian patent 489,219. Filed April 24, 1950.

Issued Dec. 30, 1952. 4 claims. Assigned to Buffalo Electro-Chemical Company, Inc.

Unbleached sulfite pulp is bleached without adversely affecting fiber strength by adding to the pulp sufficient of an alkaline peroxide solution to obtain a fiber density in the range of 20-65% and to produce a chemical content on a dry-pulp basis as follows: hydrogen peroxide, 0.3-1.75%; total alkali as sodium hydroxide, 0.75-3.25%; and maintaining the fibers damp and at a density above 20% for approximately 1-20 days at less than 130°F. The ideal temperature is 50-110°. Both soft- and hardwood sulfite pulps cooked with calcium, magnesium, ammonium, or mixed-base liquors may be utilized by this method. The bleaching may be performed on crumbs or preferably on a self-sustaining lap of the proper pulp density in any conventional manner. 2 figures. R.C.R.

BOARD

WILSON, WINFRED E. Process for manufacturing composite board. U. S. patent 2,622,276. Filed July 24, 1948. Issued Dec. 23, 1952. 3 claims. [Cl. 18-47.5]

A process for the manufacture of composite board, without previous prepressing of the loose material in the conventional tray, incorporates the use of a disposable collapsable paper container to hold the loose material and the binder. The wood particles and the binder within this container are placed directly in the board press. Irregular marginal portions of the finished board are trimmed off along with the container side-wall. 3 figures. L.C.

BOARD—SHEET FORMATION

FISCHBEIN, WILLIAM J. Method and apparatus for feeding comminuted board-forming material for pressing. U. S. patent 2,623,239. Filed Nov. 18, 1949. Issued Dec. 30, 1952. 4 claims. Assigned 50% to British Artificial Resin Company Limited. [Cl. 18-5]

A machine is described for laying a mat of board-forming material (wood powder, sawdust, etc.) upon a continuously moving band for preliminary heat treatment by radio-frequency current before application of pressure. The delivered material possesses well-formed or molded edges. 8 figures. R.C.R.

BOARD, BUILDING

MISCALL, JACK, and RAHR, CHESTER E. Building board of fiber and asphalt coated perlite. U. S. patent 2,626,864. Filed Dec. 31, 1947. Issued Jan. 27, 1953. 3 claims. Assigned to Great Lakes Carbon Corporation. [Cl. 92-3]

The invention comprises an insulating board containing asphalt-coated, heat-expanded perlite and a fibrous material (II) of organic (paper pulp, bagasse, rags, etc.) or inorganic origin. (II) may be present as 25-90% by weight of the composition and (I) may comprise 10-75%. The board is waterproof, has high wet strength, and is resistant to fire. R.C.R.

BOARD SPECIALTIES

FRYE, DE MOINE H. Reusable pallet bin. Canadian patent 489,139. Filed March 22, 1947. Issued Dec. 23, 1952. 16 claims. Assigned to Leslie T. Swallow.

A re-usable, fiberboard, shipping and storage bin can be assembled in any desired size by the addition or removal of a selected number of sections. This patent is the same as U. S. patent 2,534,011 (Dec. 12, 1950); *cf.* B.I.P.C. 21: 361. 6 figures. R.C.R.

GUYER, REYNOLDS. Bottle carrier. U. S. patent 2,622,777. Filed Aug. 5, 1948. Issued Dec. 23, 1952. 6 claims. Assigned to Waldorf Paper Products Company. [Cl. 224-48]

A generally rectangular bottle carrier is reinforced by a one-piece wire frame which, secured by notches and tabs, extends around the opening of the carrier tray and continues upward to form a U-shaped handle. 7 figures. L.C.

RINGLER, WILLIAM A. Partitioned carrier and method of making it. U. S. patent 2,623,683. Filed Feb. 20, 1947. Issued Dec. 30, 1952. 2 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-28]

A method for the manufacture of a one-piece, knock-down, partitioned paperboard bottle carrier is claimed. 9 figures. R.C.R.

BONDED FIBER WEBS

HARRIS, MELVYN J., EINBINDER, NATHAN, and MANUS, LEE A. Cushioning material and method of making same. U. S. patent 2,622,308. Filed July 19, 1951. Issued Dec. 23, 1952. 16 claims. [Cl. 28-79]

A resilient, nonseparating felt consists of 30-60% of wood fibers coated with dextrin starch and 40-70% of short cotton fibers of a waste nature. Either groundwood pulp, agitated in a forming chamber and sprayed with dextrin starch, or previously felted wood fibers are suitable, as are several varieties of waste cotton. The manufacture of this cushioning material consists primarily in cleaning, mixing, and garnetting the fibers, and compressing the mixture into a sheet. 6 figures. L.C.

OSBORNE, FAY H. Paper from long synthetic fibers and partially water soluble sodium carboxymethycellulose and method. U. S. patent 2,626,214. Filed June 14, 1949. Issued Jan. 20, 1953. 13 claims. Assigned to C. H. Dexter & Sons, Incorporated. [Cl. 92-3]

A light-weight web material of high absorbency and porosity made of various synthetic fibers (6 mm. to textile fiber length) and bonded with a sodium carboxymethylcellulose (I) having a substitution value of 0.3-0.75 is claimed. (I) acts in part as a fiber dispersing agent. Details for production of the paper on conventional papermaking machinery, its uses (tea bags), and methods for selecting a suitable (I) are given. R.C.R.

CELLULOSE—REACTIVITY

SCHLOSSER, PAUL H., and GRAY, KENNETH R. Wood pulp and method of producing same. U. S. patent 2,623,875. Filed Sept. 9, 1950. Issued Dec. 30, 1952. 4 claims. Assigned to Rayonier Incorporated. [Cl. 260-212]

Sheets of refined wood pulp, prepared for use in the production of cellulose derivatives (cellulose acetate, xanthate) are treated, preferably before

initial drying, with a mixed ether containing a polyethylene oxide radical and an aliphatic hydrocarbon radical of more than seven carbon atoms. The addition of 0.02-0.5% (based on ovendry pulp weight) of such a water-soluble mixed ether results in increased reactivity of the pulp fibers in conversion processes. It shortens the required reaction time and considerably decreases the number of unreacted fibers. Details are given for the preparation of the mixed ether and tabulated data compare the reactivity of treated and untreated acetate and viscose wood pulps. R.C.R.

CELLULOSE ESTERS

CALDWELL, JOHN R. Coagulation of oil emulsions with cellulose sulfate. U. S. patent 2,625,517. Filed Oct. 19, 1951. Issued Jan. 13, 1953. 6 claims. Assigned to Eastman Kodak Company. [Cl. 252-332]

A method of coagulating oil-in-water emulsions is covered which comprises adding thereto a water-soluble salt (e.g., sodium, ammonium, amine) of cellulose sulfate in a proportion of 0.01-5%, based on the weight of the oil phase under conditions whereby the aqueous portion of the emulsion contains the cellulose sulfate salt in solution. R.C.R.

CLAY

LYONS, SANFORD C. Method of improving kaolin and products thereof. Canadian patent 489,214. Filed June 2, 1950. Issued Dec. 30, 1952. 10 claims. Assigned to Bird Machine Co.

A method of improving kaolin by reducing its viscosity in suspensions and removing unwanted color is outlined. The final coating clay contains only particles of the size range of 2 to 10μ equivalent spherical diameter maximum and 0.25μ minimum. This is the same as U. S. patent 2,524,816 (Oct. 10, 1950); *cf.* B.I.P.C. 21: 207. 4 figures. R.C.R.

DISPENSING CONTAINERS

BROEREN, FRANK L. Dispensing package. U. S. patent 2,624,521. Filed Jan. 7, 1952. Issued Jan. 6, 1953. 7 claims. Assigned to Marathon Corporation. [Cl. 242-55.5]

A web-dispensing package (I) is claimed which is made from a single blank, comprises a container for retaining a roll of sheet material wound on a hollow core and incorporates roll retaining flaps which prevent accidental dropping of the roll should (I) be inverted. 12 figures. R.C.R.

FLOOR COVERING

BEZMAN, IRVING I. Flexible floor covering. U. S. patent 2,624,683. Filed Jan. 24, 1951. Issued Jan. 6, 1953. 5 claims. Assigned to Armstrong Cork Company. [Cl. 117-76]

A flexible, hard-surface floor covering comprises a saturated felt backing, a first coating of an aqueous dispersion containing a resinous vinyl polymer and a fused top coat deposited from an aqueous dispersion containing 20-50% (by weight) of rubberlike butadiene polymer and 50-80% reinforcing vinyl resin (polymers of vinyl chloride and styrene). 1 figure. R.C.R.

HAZELTINE, JAMES E., JR. Felt base floor covering and method of making the same. U. S. patent 2,624,682. Filed Jan. 24, 1951.

Issued Jan. 6, 1953. 6 claims. Assigned to Armstrong Cork Company. [Cl. 117-15]

An improved felt base floor covering comprises a decorative wearing surface containing a vinyl resin (I) produced by depositing a thin film of (I) on a carrier which can be a saturated felt coated with a composition containing a filler and selected resins and rubberlike polymers. 1 figure. R.C.R.

FOLDING BOXES

BERGSTEIN, ROBERT M. Partitioned carton. U. S. reissue patent 23,597. Filed March 18, 1952. Issued Dec. 23, 1952. 21 claims. [Cl. 229-28]

A folding carton incorporates partition elements which are raised automatically in the process of setting up the carton. This is a reissue of U. S. patent 2,545,803 (March 20, 1951) with four additional claims; *cf.* B.I.P.C. 21: 594-5. 19 figures. L.C.

COLLURA, PETER C. Carton. U. S. patent 2,623,684. Filed Sept. 22, 1950. Issued Dec. 30, 1952. 1 claim. Assigned to Container Corporation of America. [Cl. 229-31]

A one-piece folding carton has interlocking detents and detent-receiving openings to hold the cover and tray portions against accidental opening. 3 figures. L.C.

FEHRENKAMP, EMIL W. Carton. U. S. patent 2,625,315. Filed March 28, 1949. Issued Jan. 13, 1953. 1 claim. Assigned to Burd & Fletcher Co. [Cl. 229-45]

A collapsible carton, readily assembled for use at concession stands (e.g., for popcorn) incorporates in the top closure a locking tab of hook shape that slides easily into the slit and is retained by transverse pull imparted by pressure of the contents. 5 figures. R.C.R.

GRAY, ALFRED W. Container. Canadian patent 488,826. Filed July 7, 1950. Issued Dec. 16, 1952. 1 claim. Assigned to Abitibi Power & Paper Company, Limited.

The container is formed from a single strip of material and is assembled by folding on previously creased lines. It is suggested for use as a berry or fruit box. 6 figures. R.C.R.

HAMMOND, WEST. Disposable carton mold box for frozen food confections. U. S. patent 2,622,784. Filed Aug. 9, 1949. Issued Dec. 23, 1952. 8 claims. [Cl. 229-36]

A disposable mold box for use in the manufacture of ice cream bars and the like is made of moistureproof paperboard and has a slotted cover for the insertion of sticks in the confection. This mold can be pealed from the hardened block, thereby eliminating heating for mold removal. 6 figures. L.C.

SCHMIRLER, LEONA W. Carton for holding eggs. Canadian patent 489,359. Filed Oct. 16, 1951. Issued Jan. 6, 1953. 2 claims.

The invention deals with an egg carton cover which is lined with an adhesive strip for holding the eggs in position when the cover is open. This is the same as U. S. patent 2,594,504 (April 29, 1952); *cf.* B.I.P.C. 22: 872. 13 figures. L.C.

HYDROGEN PEROXIDE

GREENSPAN, FRANK P. Stable aqueous hydrogen peroxide and method of preparing same. U. S. patent 2,624,655. Filed Oct. 13, 1949. Issued Jan. 6, 1953. 12 claims. Assigned to Buffalo Electro-Chemical Company, Inc. [Cl. 23-207.5]

The method for stabilizing an aqueous hydrogen peroxide solution comprises adding to the peroxide 5 to 1000 p.p.m. of solution of a pyridine carboxylic acid, an alkyl substituted pyridine carboxylic acid, dipicolinic acid, quinolinic acid, or 6-methylpicolinic acid. R.C.R.

MACHINERY—CARTON-FEEDING MECHANISM

BAKER, THOMAS R., and PAGENDARM, EDWARD J. Blank feeding mechanism for folding box machines. U. S. patent 2,624,249. Filed Dec. 28, 1948. Issued Jan. 6, 1953. 4 claims. Assigned to Bemiss-Jason Machine Co. [Cl. 93-51]

An improved feeding mechanism (I) which reliably feeds single blanks and deposits them accurately in the correct position in a folding box machine is claimed. The blanks can be moved at high speed and (I) effectively eliminates air resistance against the blank surface and inertia effects. 4 figures. R.C.R.

MACHINERY—CONVERTING MACHINERY

ALLEN, HOWARD G. Bag closing machine. U. S. patent 2,624,995. Filed June 11, 1948. Issued Jan. 13, 1953. 5 claims. Assigned to Savannah Sugar Refining Corporation. [Cl. 53-142]

The preliminary tucking and closing of filled paper bags and analogous receptacles by fully automatic means is described. Subsequent folding, wrapping, sealing, etc. is done either manually or by another machine. 12 figures. R.C.R.

BAKER, THOMAS R., and PAGENDARM, EDWARD J. Folding box machine. U. S. patent 2,624,248. Filed Dec. 28, 1948. Issued Jan. 6, 1953. 4 claims. Assigned to Bemiss-Jason Machine Co. [Cl. 93-51]

The machine can be changed from one box size to another by an exchange of factory-adjusted gates and dies. The exchange does not involve readjustment of the replaced gate and die with respect to the suction gripper and path of the plunger and therefore eliminates the necessity for a complete machine readjustment when the box size is changed. The invention can be applied to both glueless-assembly machines and die-and-plunger machines for making glued boxes. 4 figures. R.C.R.

BERGSTEIN, FRANK D. Apparatus for assembling composite containers. U. S. patent 2,625,085. Filed Feb. 9, 1949. Issued Jan. 13, 1953. 7 claims. [Cl. 93-55]

Accuracy in the alignment of parts is accomplished by locating means on a conveyor on an apparatus for assembling knock-down or collapsible folding cartons from a plurality of pieces. 14 figures. R.C.R.

CLAFF, CLARENCE L., and MOELLER, CARL A. Light sensitive control for setting-up machines. U. S. patent 2,624,247. Filed June

18, 1947. Issued Jan. 6, 1953. 5 claims. Assigned to Norfolk Paper Company, Inc. [Cl. 93-36.3]

A machine for setting up cardboard boxes comprises a photoelectric cell and a source of light so positioned that when an advancing box intercepts the light beam, pressure members of the machine are made operative. This is the same as Canadian patent 483,952 (June 10, 1952); *cf.* B.I.P.C. 22: 961. 4 figures. R.C.R.

MACDONALD, CHESTER R. Apparatus for applying an aqueous bituminous emulsion to a fibrous web. U. S. patent 2,622,313. Filed Dec. 4, 1948. Issued Dec. 23, 1952. 1 claim. Assigned to The Patent and Licensing Corporation. [Cl. 29-114]

The applicator roll of an apparatus for waterproofing paperboard with a bituminous emulsion is a hollow cylinder with a number of internal ducts which run obliquely lengthwise in the roll in the manner of a screw thread. The revolution of the roll causes the ducts to exert a pumping action on the emulsion in the underlying trough and to draw the liquid into the roll at one end, expelling it at the other. The homogeneous concentration of the bitumen which is maintained by this circulation is necessary for an even application of the film to the web. 6 figures. L.C.

ROBINSON, ERNEST B. Manufacture of helically wound tubes. U. S. patent 2,623,443. Filed Feb. 28, 1948. Issued Dec. 30, 1952. 9 claims. [Cl. 93-80]

This patent pertains to improvements in the machinery for manufacturing the tubes described in U. S. patent 2,623,445 (*cf.* abstract below). 16 figures. R.C.R.

ROBINSON, ERNEST B. Method of producing helically wound containers. U. S. patent 2,623,445. Filed Feb. 5, 1947. Issued Dec. 30, 1952. 7 claims. [Cl. 93-94]

A method of producing paper or paperboard cylindrical containers of predetermined length is outlined. Each container has a helically wound, unitary pattern of approximately the same length as the container and the patent embodies a control device for regulating the cutting of the tubing so that each pattern is intact and waste is minimized. 19 figures. R.C.R.

ROSE, ALFRED G., and GILBERT, JOSEPH A. Bagmaking apparatus. U. S. patent 2,623,441. Filed Jan. 8, 1948. Issued Dec. 30, 1952. 5 claims. Assigned to Rose Brothers (Gainsborough) Limited. [Cl. 93-26]

An apparatus makes bags from a single web of paper, film, or foil (preferably a heat-sealing material) by wrapping the material around a tubular former and joining the edges in a longitudinal seam; the end of the resulting tubular web is sealed, folded back, and secured to the wall of the tube to form the base of the bag. A knife assembly cuts the tube transversely at the required length to sever the completed bag. 7 figures. L.C.

SHIELDS, ALBERT F. Folding machine. U. S. patent 2,622,493. Filed May 7, 1949. Issued Dec. 23, 1952. 4 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc. [Cl. 93-49]

Improvements for a folding machine previously covered by U. S. patent 2,583,712 (*cf.* B.I.P.C. 22: 543) are listed. These include a stacking arrange-

ment which permits the delivery of warped blanks, different prefolding elements, and improved recreasing, adjusting, and stop means. 18 figures. R.C.R.

THAXTON, JAMES B. Box partition forming and inserting machine. U. S. patent 2,623,442. Filed Oct. 21, 1949. Issued Dec. 30, 1952. 10 claims. Assigned to Paper Package Company. [Cl. 93-37]

A machine which selects box partition elements from a supply source, forms them into the required shape, applies adhesive, and inserts them into the box, uses suction-type forming and inserting heads in conjunction with a forming plate, an adhesive roller, and a conveyor for advancing boxes and aligning them with the inserting head. 16 figures. L.C.

WEISS, ARTHUR J. Apparatus for setting up folding cartons and the like. U. S. patent 2,625,084. Filed March 2, 1949. Issued Jan. 13, 1953. 4 claims. Assigned to Robert Gair Company, Inc. [Cl. 93-53]

An apparatus to assist the manual setting up of folding cartons of the "simplex" type comprises a substantially flat central portion with brackets which incline outward at an angle and vertically upward forming, with supporting arms, a cradle to support the cartons with their ends sprung upward. This frees both hands of the operator for simultaneous folding and tucking. 6 figures. L.C.

MACHINERY—CREPING MACHINE

HAAS, RUDOLF. Apparatus for creping paper. U. S. patent 2,623,572. Filed May 19, 1950. Issued Dec. 30, 1952. 9 claims. Assigned to Zellstoffabrik Waldhof. [Cl. 154-30]

An apparatus for creping paper in two directions is described which forms corrugations (I) parallel to the longitudinal axis of the paper web and comprises means for driving forward the longitudinal corrugated paper at the tops of the longitudinal (I) in one plane and retarding the paper at the tops of the (I) in the other plane. This is accomplished by using a grooved roll and a rubber counter roll and brake means to retard the paper. 7 figures. R.C.R.

MACHINERY—CUTTERS

GARRETT, ELMER E. Paper-cutting mechanism. U. S. patent 2,625,224. Filed Jan. 17, 1951. Issued Jan. 13, 1953. 5 claims. Assigned to The Sperry Corporation. [Cl. 164-68]

The machine comprises a pair of vertically opposed, rapidly rotating cutting rolls (I) and a web feeding mechanism which is operative to insert successively predetermined lengths of a web of stock between the rolls in timed relation to the rotation of the rolls. One of (I) carries a cutting blade and the other an anvil against which the blade cuts. A method is provided by which the life of a cutting blade made of a known material may be quickly and accurately determined by using a test blade for cutting a given grade of stock. 9 figures. R.C.R.

MACHINERY—DRYERS

CHAPLIN, MERLE P. Apparatus for operating molded fiber drying dies. U. S. patent 2,624,956. Filed Nov. 8, 1946. Issued Jan. 13, 1953. 6 claims. [Cl. 34-146]

A machine for the drying of molded-pulp articles utilizes a cam track for maintaining the drying dies in compressive contact with the pulp article. This is the same as Canadian patent 470,687 (Jan. 9, 1951); *cf.* B.I.P.C. 21: 436-7. 5 figures. R.C.R.

MACHINERY—JOGGERS

PEUGNET, WILLIAM R. Paper jogging machine. U. S. patent 2,624,577. Filed Sept. 7, 1950. Issued Jan. 6, 1953. 4 claims. [Cl. 271-89]

A lightweight paper jogger holds the stack of paper without the aid of the operator and automatically ejects paper dust and cuttings from the cradle as it operates. The vibratory and rocking motions of the paper-holding cradle are extremely rapid and short. The cradle assembly is resiliently suspended from a rigid hanger in a way which permits motion of the cradle in three planes and provides rapid springback of the cradle without transmitting violent vibrations to the base on which the unit is operating. 3 figures. L.C.

MACHINERY—PAPER MACHINE—YANKEE TYPE

METCALFE, WILLIAM K. Papermaking machine. U. S. patent 2,622,343. Filed Feb. 9, 1950. Issued Dec. 23, 1952. 8 claims. Assigned to J. O. Ross Engineering Corporation. [Cl. 34-122]

The invention embodies improvements on the Yankee drier. These consist of an increased air flow impinged on the sheet at closer intervals than heretofore and recirculation and re-use of parts of the drying air. 6 figures. J.R.P.

MACHINERY—PASTING MACHINE

KINDSETH, HAROLD V. Pasting mechanism for bag closing and sealing machines. U. S. patent 2,624,309. Filed Nov. 13, 1950. Issued Jan. 6, 1953. 12 claims. Assigned to Bemis Bro. Bag Co. [Cl. 118-8]

A pasting mechanism is claimed which provides for a stream of liquid adhesive to be impinged upon a wall surface area of a bag to be sealed without otherwise disturbing the bag wall. 11 figures. R.C.R.

MACHINERY—PRESSES

HEDIN, BORJE V. Wall-board presses and other similar multiple presses. Canadian patent 489,565. Filed Sept. 13, 1950. Issued Jan. 13, 1953. 1 claim. Assigned to Aktiebolaget Motala.

A winding-path arrangement of the heating-medium flow channels in the press plates of multiple presses has been devised, whereby the hot water or steam is supplied to adjacent sections of a plate through a common entering conduit and is discharged through a common discharge conduit. This arrangement insures a relatively constant temperature in all parts of the plate and eliminates the need for a plurality of conduits and distributor and collection vessels. 1 figure. L.C.

PETERSON, WALTER G. Paper carton collapser. U. S. patent 2,625, 096. Filed Nov. 2, 1950. Issued Jan. 13, 1953. 1 claim. [Cl. 100-76]

A paper-carton collapser consists of a hollow metal casing lined with

crank-operated springs which contract to crush the inserted paper milk carton and fold it into a small space for convenient disposal. 6 figures. L.C.

MACHINERY—SLITTERS AND WINDERS

CARTER, THOMAS N. Score-cut slitting mechanisms. Canadian patent 489,387. Filed Oct. 7, 1950. Issued Jan. 6, 1953. 9 claims. Assigned to Cameron Machine Company.

A variable-pressure cutter-wheel assembly for score-cut slitting and winding machines has a governing mechanism operable by hydraulic, pneumatic, or electrical means which adjusts the pressure of the cutter wheel to the speed of travel of the web and the varying thickness and hardness of different materials. Premature failure of the cutter edge resulting from excess pressure against the backing roll during acceleration and deceleration of the web is thus prevented. 7 figures. L.C.

MACHINERY—VATS

HORNBOSTEL, LLOYD. Fluid pressure sealed garter strap for cylinder molds. U. S. patent 2,626,543. Filed Oct. 27, 1948. Issued Jan. 27, 1953. 5 claims. Assigned to Beloit Iron Works. [Cl. 92-43]

Fluid pressure brings a sealing ring into contact with the circular end faces of a rotatable cylinder mold to form a liquid-tight seal for cylinder-type paper machines. This is the same as Canadian patent 478,858 (Nov. 27, 1951); *cf.* B.I.P.C. 22: 376. 4 figures. L.C.

PACKAGING

LIGHT, LOUIS. Containers. Canadian patent 488,884. Filed March 6, 1950. Issued Dec. 16, 1952. 3 claims. Assigned to Federal Confectionary Incorporated.

The container is designed for shipping and displaying fragile articles. It combines a tray-like insert for supporting the article free from contact with the container walls and a transparent section in the box top for viewing. 4 figures. R.C.R.

WHITE, RAY T. Method of packaging elongated articles. U. S. patent 2,624,989. Filed Aug. 3, 1949. Issued Jan. 13, 1953. 2 claims. Assigned to The Hankins Container Company. [Cl. 53-3]

A protective wrapper for fluorescent lamp tubes is essentially a corrugated blank wrapped around the tube, the ends being folded inward and tape-sealed. Noncorrugated portions on either end and along the longitudinal seam enable such folding on relatively heavy corrugated. The method for cutting, folding, and wrapping with this material is described. 10 figures. L.C.

PAPER—COATED

MIKKELSEN, ADOLPH E. Machine for coating web material. U. S. patent 2,622,558. Filed Jan. 19, 1948. Issued Dec. 23, 1952. 3 claims. Assigned to Inland Wallpaper Company. [Cl. 118-249]

A machine for the uniform coating of web material prior to printing has a pivotal arrangement for the movement of the fountain roll and the color pan assembly relative to the backing roll; the fountain roll is mounted on the color pan. After receiving the coating from the fountain roll, the web, held by suction to a perforated flexible belt, is drawn past small-diameter,

highly polished finishing rolls which are positively driven in a direction opposite to the travel of the web, at a speed exceeding the speed of travel of the web. A spring-urged idler pulley is employed for maintaining the desired tension on the belt drive independently of the relative positioning of the fountain roll; both coarse and fine adjustments of this roll relative to the backing roll can be made without disconnecting the fountain roll driving mechanism. 6 figures. L.C.

MONTGOMERY, WILLIAM J. Coated paper. Canadian patent 489,396. Filed April 5, 1943. Issued Jan. 6, 1953. 28 claims. Assigned to The Champion Paper and Fibre Company.

A method is provided for the continuous production of a uniformly high-quality, cast-surfaced, coated paper. This is the same as U. S. patent 2,568,288 (Sept. 18, 1951); *cf.* B.I.P.C. 22: 153-4. L.C.

PAPER—SHEET FORMATION

DUVALL, THURE C. Manufacture of air-laid felts. U. S. patent 2,624,079. Filed Aug. 16, 1949. Issued Jan. 6, 1953. 10 claims. Assigned to Wood Conversion Company. [Cl. 19-155]

The apparatus for forming air-laid fiber felts comprises a movable endless conveyor (I) on which fibers (e.g., wood) are deposited to build up a mat. A number of deposition chambers are aligned over (I) and allow the fibers suspended in air to deposit on (I). Feeding means of the two end chambers are arranged to feed in opposite directions; homogeneous distribution of the fibers from the fluid vehicle results. 3 figures. R.C.R.

PAPER SPECIALTIES

BRYCE, WILLIAM H. Method of making paper bags. U. S. patent 2,624,246. Filed Aug. 3, 1949. Issued Jan. 6, 1953. 2 claims. Assigned to Dixie Wax Paper Company. [Cl. 93-35]

A moisture-vapor resistant glassine bag which is adapted for packaging of potato chips includes a transparent inspection window. This is the same as Canadian patent 476,058 (Aug. 14, 1951); *cf.* B.I.P.C. 22: 154. 11 figures. R.C.R.

CLUETT, SANFORD L. Modified paper and method for its manufacture. U. S. patent 2,624,245. Filed Dec. 16, 1947. Issued Jan. 6, 1953. 13 claims. Assigned to Cluett, Peabody & Co., Inc. [Cl. 92-68]

A process and apparatus are claimed for producing an uncreped paper web of water-laid, adherent cellulose fibers, with smooth, practically parallel faces and substantial permanent extensibility (up to 100% of the length) in excess of the primitive elastic limit of the web. The plastic paper sheet (preferably taken from the paper machine before drying or a dried paper reconditioned to a plastic state) is subjected to compression in a direction parallel to the surfaces of the paper so that a substantial decrease in the dimension of the paper is produced while it is under considerable pressure perpendicular to its surface to restrain it from creping. 6 figures. R.C.R.

COVAN, MORTON. Two-way mailing device. U. S. patent 2,623,686. Filed April 16, 1951. Issued Dec. 30, 1952. 2 claims. [Cl. 229-73]

A match book which has folded flaps for more lengthy advertising can carry a detachable post card or be converted into an envelope to act as a two-way mailing device. An attached carbon leaf allows the mailable portion to be filled out without the aid of a pencil. 10 figures. L.C.

McDOWELL, WILLIAM J. Siftproof automatic bag and method of making. U. S. patent 2,622,786. Filed Feb. 8, 1949. Issued Dec. 23, 1952. 6 claims. Assigned to Benj. C. Betner Company. [Cl. 229-55]

A conventional automatic bag formed from a two-ply gusseted tube is rendered siftproof by a heat-sealed inner ply which is independent of the outer ply. The latter is pulled into the usual side diamond fold, and the sealed inner ply collapses into a rectangular preformed bottom which allows the bag to stand upright. 5 figures. L.C.

SWIFT, DONALD D., and KOHLER, JOHN J. Decalcomania for metal transfers. U. S. patent 2,625,496. Filed Sept. 30, 1950. Issued Jan. 13, 1953. 6 claims. Assigned to M. Swift & Sons, Inc. [Cl. 154-46.8]

A decalcomania for the application of metal decorations to smooth or irregular surfaces is a layered composite of a paper transfer sheet, a water-soluble adhesive, a butadiene-acrylonitrile polymer, in some instances a layer of lacquer, and a metal foil. 1 figure. L.C.

WILLIAMS, JAMES E. Combined greeting and gift bearing folder. U. S. patent 2,623,687. Filed Jan. 7, 1949. Issued Dec. 30, 1952. 5 claims. [Cl. 229-87]

The construction of a combined greeting and gift-bearing folder from a sheet material, such as paper, is claimed. 7 figures. R.C.R.

PHYSICAL TESTING—MOISTURE

SPALDING, JOHN R. Apparatus for measuring moisture. U. S. patent 2,621,232. Filed Feb. 8, 1951. Issued Dec. 9, 1952. 6 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 175-183]

This patent is similar to U. S. patent 2,621,233 (*cf.* abstract below), but differs in the type of electrodes employed; it can be used for moisture determinations of nonsheet-like materials such as baled staple fiber and beamed yarn. 9 figures. R.C.R.

SPALDING, JOHN R. Apparatus for measuring moisture in sheet material. U. S. patent 2,621,233. Filed Feb. 8, 1951. Issued Dec. 9, 1952. 6 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 175-183]

The apparatus determines the moisture content of organic materials including sheets of wood pulp, cotton linters, and cellulose products (textile fibers, cellophane) by measuring the electrical conductivity of the sample with means including a self-balancing high-resistance bridge. The average percentage of moisture may be read directly from a dial at the output end of the machine. 7 figures. R.C.R.

PYRITES

ROBERTS, ELLIOTT J., FOLEY, RUPERT M., and WELLS, DAVID F. Roasting of sulfides. U. S. patent 2,625,464. Filed May 24, 1949.

Issued Jan. 13, 1953. 4 claims. Assigned to The Dorr Company. [Cl. 23-177]

A process of producing sulfur trioxide- and sulfur-free sulfur dioxide gas from pyrite is claimed. A fluidized bed of finely divided pyrite particles (I) is established and maintained in a roasting zone and a gas bearing free oxygen is passed through at fluidizing velocity. (I) react with oxygen at roasting temperature to yield a gas (II) of sulfur and sulfur dioxide. Roasted (I) containing less than 2% by weight of sulfidic sulfur are discharged and oxygen is supplied to (II) to convert free sulfur to sulfur dioxide; overoxidation to sulfur trioxide is prevented by maintenance of a trace of an entrained iron-bearing compound as a buffer. 3 figures.

R.C.R.

RAYON—VISCOSE PROCESS

BROWN, KENNETH R. Cellulose-morpholinium derivative composition and process. U. S. patent 2,623,874. Filed Jan. 16, 1950. Issued Dec. 30, 1952. 15 claims. Assigned to Atlas Powder Company. [Cl. 260-212]

The incorporation of N-methyl-N-lauryl morpholinium methosulfate (I) or N-ethyl-N-cetyl-morpholinium ethosulfate (II) in the coagulating bath in the viscose process prevents incrustation of the spinning orifice (*cf.* U. S. patent 2,495,833, Jan. 31, 1950). (I) or (II) may now be added at an earlier stage in the process by incorporation in the pulp. Addition of 10% aqueous (I) (one pound of solution per 100 pounds of dry cellulose) in the washing of the refined pulp, or spraying 20% aqueous (II) on a wet web of pulp (10 pounds per 100 pounds of dry cellulose) will give a product containing 0.01-0.2% (I) or (II).

J.W.G.

SETUP BOXES

HILL, DONALD W. Plastic cover for waxed paper containers. U. S. patent 2,623,685. Filed Oct. 3, 1947. Issued Dec. 30, 1952. 1 claim. Assigned to Crown Cork Specialty Corporation. [Cl. 229-43]

A friction-sealed replaceable cover for polygonal-shaped containers of the sort used in food-freezing lockers is made of transparent polystyrene. 3 figures.

L.C.

STORTZ, JOHN H. Telescoping box with cover fastener. U. S. patent 2,625,316. Filed Nov. 18, 1949. Issued Jan. 13, 1953. 1 claim. [Cl. 229-45]

A setup box suitable for mailing without additional fastening has tabs which protrude from the box sides through slits in the cover; these tabs are folded down and sealed to the cover by means of their adhesive surface, thereby rendering the cover secure. 3 figures.

L.C.

SHIPPING CONTAINERS

KIECKHEFER, HERBERT M. Container. U. S. patent 2,622,785. Filed April 28, 1949. Issued Dec. 23, 1952. 6 claims. Assigned to Kieckhefer Container Company. [Cl. 229-44]

The invention deals with metal-reinforced cover flaps of a returnable cardboard carrier for beverage bottles. This is the same as Canadian patent 438,019 (May 6, 1952); *cf.* B.I.P.C. 22: 797. 4 figures.

L.C.

CANDELL, EARL B. Shipping and display package. U. S. patent 2,623,682. Filed Dec. 28, 1949. Issued Dec. 30, 1952. 3 claims. Assigned to General Electric Company. [Cl. 229-19]

A container for the protection and display of spherical objects such as small flashlight lamps is a carton with a pull-out tray which has rows of circular cuts to hold the inserted bulbs. 14 figures. L.C.

SHIPPING CONTAINERS—FIBER DRUMS

MACCHESNEY, CHESTER M. Container. U. S. patent 2,625,317. Filed May 24, 1945. Issued Jan. 13, 1953. 1 claim. Assigned to Acme Steel Company. [Cl. 229-47]

The two metal end walls of a fiber-drum container are connected at their centers by a double wire which, when the top wall or cover is rotated, shortens and thus draws the end walls into tight engagement with the annular wall. This device is particulary applicable to containers for powdered or granular material, but also finds use in the fixing of metal end protectors to rolls of paper or fabric. In this case the wires are passed through the hollow core of the roll and twisted until the end plates engage the roll. 9 figures. L.C.

MAIER, CURTIS E., MINNEAR, FESTUS L., and BROCKETT, HALFORD E. Method of making lined lapped seam fiber containers. U. S. patent 2,623,444. Filed April 8, 1946. Issued Dec. 30, 1952. 4 claims. Assigned to Continental Can Company, Inc. [Cl. 93-94]

The body of a cylindrical fiber lap-seam container is constructed from web material to which the liner is secured while in the flat, so that a unitary structure results and the lining projects beyond the sides of the body web. The projecting lining is folded about the edge of the body web onto the opposite face thereof and used in making the lapped seam. 13 figures. R.C.R.

WILCOX, ISAAC L. Container and method of making same. U. S. patent 2,623,680. Filed Sept. 4, 1948. Issued Dec. 30, 1952. 3 claims. Assigned to Oswego Falls Corporation. [Cl. 229-4.5]

A tubular paperboard container for liquids is formed of equal-length, inner and outer multi-ply cylindrical layers. The bottom-end closure is accomplished by axially shifting the layers and inserting a paperboard disk into the slightly protruding outer layer which can then be crimped to lock in the disk. Hot-melt and heat-resistant adhesives are used. 4 figures. R.C.R.

WILCOX, ISAAC L. Container body and method of making same. U. S. patent 2,623,681. Filed Sept. 4, 1948. Issued Dec. 30, 1952. 4 claims. Assigned to Oswego Falls Corporation. [Cl. 229-4.5]

The patent is similar to U. S. patent 2,623,680 (*cf.* preceding abstract). The insertion of sheets nonabsorbent to hot-melt adhesives between absorbent paperboard plies and their combination by heat resistant and hot-melt (wax) adhesives is claimed; the procedures are performed on conventional container-making machinery and no handwork is involved. 5 figures E.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

ROSS, LAWRENCE T. Bag with handles. U. S. patent 2,625,318. Filed May 29, 1946. Issued Jan. 13, 1953. 3 claims. Assigned to Union Bag & Paper Corporation. [Cl. 229-54]

Strong paper handles and the method of stiching them securely to the closed end seam of multi-ply bags have been devised. 5 figures. L.C.

WET STRENGTH

KAMLET, JONAS. High wet-strength paper and process of making. U. S. patent 2,624,686. Filed Nov. 4, 1948. Issued Jan. 6, 1953. 7 claims. Assigned to Mathieson Chemical Corporation. [Cl. 117-155]

A process is claimed for increasing the wet strength of paper by treating it with an aqueous solution of an acidic catalyst and 0.5-10.0% (based on the ovendry paper weight) of a monomeric resin—e.g., N, N′, N″, N‴-tetra (formylhydroxymethyl)-tetrahydroimidaz(d)imidazole-2,5(1,3)-dione. The monomer polymerizes on the dried paper during the curing operation. The resultant paper also has high resistance to grease, oil, soap, and other liquids. R.C.R.

WOODS, WALTER E., and SCHENCK, WILLARD A. Glyoxal treatment of absorbent paper to improve wet strength. U. S. patent 2,622,960. Filed March 16, 1948. Issued Dec. 23, 1952. 10 claims. Assigned to A. P. W. Products Company, Inc. [Cl. 8-116.4]

A deposit of from 0.3-3.0% glyoxal on a preformed sheet of absorbent paper is applied to improve its wet strength (I) with minimum loss in absorbency. The treated sheet must be heated to at least 212°F. for 15-60 seconds to cause reaction of the glyoxal with the cellulose. (I) of glyoxal-treated papers from bleached and unbleached sulfite and kraft, bleached soda, alpha, and groundwood pulps showed increases. R.C.R.

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